Montana Department of
ENVIRONMENTAL QUALITY

Brian Schweitzer, Governor

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January 22, 2009

NorthWestern Energy
Rick Walsh
40 East Broadway
Butte, MT 59701

Dear Mr. Walsh:

Air Quality Permit #4255-00 is deemed final as of January 22, 2009, by the Department of Environmental Quality (Department). This permit is for NorthWestern Energy's Mill Creek Generating Station. All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For the Department,

Vickie Walsh
Air Permitting Program Supervisor
Air Resources Management Bureau
(406) 444-9741

Jenny O'Mara
Environmental Engineer
Air Resources Management Bureau
(406) 444-1452

VW
Enclosure

Montana Department of Environmental Quality
Permitting and Compliance Division

Air Quality Permit # 4255-00

NorthWestern Energy
Mill Creek Generating Station
40 East Broadway
Butte, MT 59701

January 22, 2009

AIR QUALITY PERMIT

Issued To: NorthWestern Energy 40 East Broadway St. Butte, MT 59701	Permit: #4255-00 Application Complete: 12/10/08 Preliminary Determination Issued: 12/19/08 Department Decision: 1/6/09 Permit Final: 1/22/09 AFS #: 023-0002

An air quality permit, with conditions, is hereby granted to NorthWestern Energy (NWE), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

SECTION I: Permitted Facilities

A. Permitted Equipment

NWE proposes to construct and operate a facility equipped with four simple-cycle, dual fuel-fired generating units. Each generating unit consists of two aeroderivative combustion turbines and one electric generator rated at 49.6 megawatts (MW). The facility will serve as a regulating resource to stabilize the transmission grid due to historical supply and load variations and the integration of non-dispatchable and unpredictable fluctuations from intermittent renewable resources, such as wind power. The facility's combined net output will be approximately 200-MW power for delivery to the existing power grid.

NWE proposes phased construction of the simple-cycle turbines along with other miscellaneous equipment, including: a 1,675 horsepower (hp) emergency diesel generator, a 308.4 hp emergency diesel fire pump, two above-ground 1,000,000 gallon diesel fuel tanks and two 10,000 gallon aqueous ammonia tanks. Emissions from the generating units will be controlled utilizing water injection, selective catalytic reduction (SCR) and catalytic oxidation (CO).

B. Plant Location

NWE's facility also known as the Mill Creek Generating Station (MCGS) is located near the intersection of MT-1 and county road 273 approximately 3 miles southeast of Anaconda, Montana. The property lies within a 50-acre parcel in the NW¼ of Section 17 and the SW ¼ of Section 8, Township 4 North, Range 10 West in Deer Lodge County, Montana.

SECTION II: Conditions and Limitations

A. Operational and Emission Limitations

1. NWE shall operate four simple cycle, dual fuel powered generating units each rated at 49.6 MW. Each generating units consist of two turbines and a common generator (ARM 17.8.749 and ARM 17.8.752).

2. NWE shall only combust pipeline quality natural gas or ultra-low sulfur (#2) fuel oil in the generating units (ARM 17.8.749, ARM 17.8.752 and 40 CFR 60 Subpart KKKK).

3. Each combustion turbine may only combust ultra-low fuel oil (#2) for up to 720 hours per year (ARM 17.8.752).

4. Each simple cycle generating unit shall have a minimum stack exhaust height of at least 90-feet from final grade (ARM 17.8.749).

5. NWE shall install, operate and maintain water injection, selective catalytic reduction unit (SCR), and catalytic oxidation on each generating unit to control oxides of nitrogen (NOx), carbon monoxide (CO) and volatile organic compounds (VOCs) (ARM 17.8.752).

6. NWE shall control particulate matter (PM), PM with an aerodynamic diameter of 10 microns or less (PM_{10}), PM with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) and sulfur dioxide (SO_2) emissions from each of the generating units by utilizing good combustion practices and only combusting low sulfur fuels (ARM 17.8.752).

7. Emissions of NOx from each generating unit shall not exceed 11.07 pounds per hour (lb/hr) using natural gas and 10.09 lb/hr based on a 30-day rolling average using ultra low sulfur fuel oil (#2) based on a 30-day rolling average, effective during all periods of operation, including startup and shutdown (ARM 17.8.752).

8. Emissions of CO from each generating unit shall not exceed 10.78 lb/hr using natural gas and 9.83 lb/hr based on a 30-day rolling average using ultra low sulfur fuel oil (#2) based on a 30-day rolling average, effective during all periods of operation, including startup and shutdown (ARM 17.8.752).

9. Emissions of VOCs from each generating unit shall not exceed 2.47 lb/hr using natural gas and 18.98 lb/hr based on a 30-day rolling average using ultra low sulfur fuel oil (#2) based on a 30-day rolling average, effective during all periods of operation, including startup and shutdown (ARM 17.8.752).

10. Emissions of $PM/PM_{10}/PM_{2.5}$ from each generating unit shall not exceed 7.30 lb/hr based on a 30-day rolling average using natural gas and 19.30 lb/hr using ultra low sulfur fuel oil (#2) based on a 30-day rolling average, effective during all periods of operation, including startup and shutdown (ARM 17.8.752).

11. Emissions of SO_2 from each generating unit shall not exceed 0.83 lb/hr based on a 30-day rolling average using natural gas and 0.80 lb/hr using ultra low sulfur fuel oil (#2) based on a 30-day rolling average, effective during all periods of operation, including startup and shutdown (ARM 17.8.752).

12. NWE shall limit the hours of operation of the 1675 brake-horsepower (bhp) (10.3 million British thermal units per hour (MMBtu/hr)) diesel-fired emergency generator and the 308 brake horsepower (bhp) (2.51 MMBtu/hr)) water pump to no more than 500 hours per unit for a rolling 12-month period (ARM 17.8.749 and ARM 17.8.752).

13. NWE shall install, calibrate, maintain and operate a NO_x Continuous Emission Monitoring System (CEMS) to monitor compliance with each generating unit's NO_x emission limit. The applicable NOx CEMS shall be installed and certified within 180 days of initial startup following issuance of Permit #4255-00 (ARM 17.8.752 and 40 CFR 60 Subpart KKKK).

14. NWE shall install, calibrate, maintain and operate a CO CEMS to monitor compliance with each generating unit's CO emission limits. The applicable CO CEMS shall be installed and certified within 180 days of initial startup following issuance of Permit #4255-00 (ARM 17.8.752).

15. NWE shall operate and maintain the generating units, monitoring equipment, and ancillary equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including startup, shutdown and malfunction (ARM 17.8.340 and 40 CFR 60 Subpart KKKK).

16. NWE shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

17. NWE shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

18. NWE shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.17 (ARM 17.8.749).

19. NWE shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements contained in 40 CFR 60, Subpart KKKK (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

20. NWE shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements of the Acid Rain Program contained in 40 CFR Parts 72-78 (40 CFR Part 72 through 40 CFR Part 78).

21. NWE shall comply with Section III, Conditions and Limitations during Commissioning Period, of this permit for a period of 16 weeks from initial startup of the generating units (ARM 17.8.749).

B. Testing Requirements

1. NWE shall test each of the 49.6 MW simple cycle generating unit using natural gas to demonstrate compliance with the steady-state NO_x and CO emission limits contained in Section II.A.7 and II.A.8. Testing shall be conducted concurrently for NO_x and CO within 180 days of initial start-up of each of the simple cycle generating unit, and shall conform with the requirements contained in 40 CFR 60 Subpart KKKK. After the initial testing, each generating unit shall be tested annually, and the time between tests shall not exceed 14 months since the previous performance test (ARM 17.8.105, ARM 17.8.749, and 40 CFR 60 Subpart KKKK).

2. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

3. The Department of Environmental Quality (Department) may require further testing (ARM 17.8.105).

C. Continuous Emissions Monitoring Systems (CEMS)

1. NWE shall install, operate, calibrate, and maintain CEMS as follows:

   a. NWE shall operate a CEMS for the measurement of NO_X on each generating unit stack, and use the data to monitor compliance with the NO_x emission limits contained in Section II.A.7 (ARM 17.8.105, 17.8.749, 40 CFR 60 Subpart KKKK, and 40 CFR 72-78).

b. NWE shall operate a CEMS for the measurement of CO on each generating unit stack, and use the data to monitor compliance with the CO emission limits contained in Section II.A.8 (ARM 17.8.105, 17.8.749, and 40 CFR 72-78).

c. A CEMS for the measurement of oxygen (O_2) or carbon dioxide (CO_2) content shall be operated on each generating unit stack (ARM 17.8.105, ARM 17.8.749, 40 CFR 60 Subpart KKKK and 40 CFR 72-78).

2. All continuous monitors required by this permit and by 40 CFR Part 60 shall be operated, excess emissions reported as per 40 CFR 60, Subpart KKKK, and performance tests conducted in accordance with the requirements of 40 CFR 60, Subpart A; 40 CFR Part 60, Appendix B (Performance Specifications #2, #3, #4 and/or #4A); 40 CFR 60, Subpart KKKK and 40 CFR Part 72-78, as applicable (ARM 17.8.749, 40 CFR 60, Subpart KKKK, 40 CFR Part 60, and 40 CFR Part 72-78).

3. NWE shall develop and keep on-site a quality assurance plan for all the CEMS (40 CFR 60, Subpart KKKK).

4. On-going quality assurance for the CEMS must conform to 40 CFR Part 60, Appendix F (ARM 17.8.749, 40 CFR Part 60 Appendix F).

5. NWE shall maintain a file of all measurements from the CEMS and performance testing measurements, including: all CEMS performance evaluations; all CEMS or monitoring device calibration checks and audits; all adjustments and maintenance performed on these systems or devices. These shall be recorded in a permanent form suitable for inspection and shall be retained on-site for at least 5 years following the date of such measurements and reports. NWE shall supply these records to the Department upon request (ARM 17.8.749).

D. Operational Reporting Requirements

1. NWE shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. NWE shall document, by month, the hours of operation for each turbine (two per generating unit) when using ultra-low sulfur (#2) fuel oil. By the 25th day of each month, NWE shall total the hours of operation for each turbine, during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.3. The information for each of the previous months shall be submitted along with the annual emissions inventory (ARM 17.8.749).

3. NWE shall document NO_x emissions from each generating unit at least once per hour. In addition, once per hour, NWE shall calculate the previous 4-hour rolling average emission rate for each of the generating units in conformance with the requirements contained in 40 CFR 60 Subpart KKKK (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

4. NWE shall calculate the 30-day rolling average emission rate for each generating unit to verify compliance with the limitations in Sections II.A.7 through II.A.11. This information shall be maintained on site and submitted upon request of the Department (ARM 17.8.749).

5. NWE shall document, by month, the total hours of operation of the emergency diesel-fired emergency generator and emergency water pump. By the 25th day of each month, NWE shall total the hours of operation of each for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.12. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

6. NWE shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include ***the addition of new emission unit***, a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).

7. All records compiled in accordance with this permit must be maintained by NWE as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

E. Notification

NWE shall provide the Department with written notification of the following dates within the specified time periods (ARM 17.8.749):

1. Beginning actual construction of the facility within 30 days after actual construction has begun;

2. Actual start-up date of each 49.6-MW generating unit within 15 days after the actual start-up of the generating unit.

SECTION III: Conditions and Limitations during Commissioning Period

1. NWE shall operate four simple cycle, dual fuel powered generating units rated at 49.6 MW. Each generating unit consists of two turbines and a common generator (ARM 17.8.749 and ARM 17.8.752).

2. NWE shall only combust pipeline quality natural gas or ultra- low sulfur (#2) fuel oil in the generating units (ARM 17.8.749, ARM 17.8.752 and 40 CFR 60 Subpart KKKK).

3. NWE shall control PM, PM_{10}, $PM_{2.5}$, and SOx emissions from each of the 49.6 MW dual fuel powered generating units by utilizing good combustion practices and only combusting low sulfur fuels (ARM 17.8.752).

4. NWE shall maintain and operate all equipment including associated air pollution control equipment in a manner consistent with air pollution control practices for minimizing emissions (ARM 17.8.749).

5. During the commissioning period, NOx emissions from the generating units shall not exceed 78.17 lb/hr based on a 1-hour average using natural gas and 84.64 lb/hr using ultra low sulfur fuel oil (#2) based on a 1-hour average (ARM 17.8.749).

6. During the commissioning period, CO emissions from the generating units shall not exceed 58.98 lb/hr based on a 1-hour average using natural gas and 52.29 lb/hr using ultra low sulfur fuel oil (#2) based on a 1-hour average (ARM 17.8.749).

7. During the commissioning period, VOC emissions from the generating units shall not exceed 2.47 lb/hr based on a 1-hour average using natural gas and 27.62 lb/hr using ultra low sulfur fuel oil (#2) based on a 1-hour average (ARM 17.8.749).

8. During the commissioning period, $PM/PM_{10}/PM_{2.5}$ emissions from the generating units shall not exceed 7.30 lb/hr based on a 1-hour average using natural gas and 19.30 lb/hr using ultra low sulfur fuel oil (#2) based on a 1-hour average (ARM 17.8.749).

9. During the commissioning period, SO_2 emissions from the generating units shall not exceed 0.83 lb/hr based on a 1-hour average using natural gas and 0.80 lb/hr using ultra low sulfur fuel oil (#2) based on a 1-hour average (ARM 17.8.749).

10. NWE shall operate and maintain the generating units, monitoring equipment, and ancillary equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including startup, shutdown, malfunction and during the commissioning period (ARM 17.8.340 and 40 CFR 60 Subpart KKKK).

11. The requirements of Section III, Conditions and Limitations during Commissioning Period shall only apply for a period of 16 weeks from initial startup of the generating units, or any time following maintenance that requires removal or replacement of a combustion turbine. (ARM 17.8.749).

SECTION IV: General Conditions

A. Inspection – NWE shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if NWE fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving NWE of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

H. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by NWE may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

Attachment 2

INSTRUCTIONS FOR COMPLETING EXCESS EMISSION REPORTS (EER)

PART 1 Complete as shown. Report total time during the reporting period in hours. The determination of plant operating time (in hours) includes time during unit startup, shutdown, malfunctions, or whenever pollutants of any magnitude are generated, regardless of unit condition or operating load.

Excess emissions include all time periods when emissions, as measured by the CEMS, exceed any applicable emission standard for any applicable time period.

Percent of time in compliance is to be determined as: (1 – (total hours of excess emissions during reporting period / total hours of CEMS availability during reporting period)) x 100

PART 2 Complete as shown. Report total time the point source operated during the reporting period in hours. The determination of point source operating time includes time during unit startup, shutdown, malfunctions, or whenever pollutants (of any magnitude) are generated, regardless of unit condition or operating load.

Percent of time CEMS was available during point source operation is to be determined as: (1–(CEMS downtime in hours during the reporting period* /total hours of point source operation during reporting period)) x 100

* All time required for calibration and to perform preventative maintenance must be included in the CEMS downtime.

PART 3 Complete a separate sheet for each pollutant control device. Be specific when identifying control equipment operating parameters. For example: number of TR units, energizers for electrostatic precipitators (ESP); pressure drop and effluent temperature for baghouses; and bypass flows and pH levels for scrubbers. For the initial EER, include a diagram or schematic for each piece of control equipment.

PART 4 Use Table I as a guideline to report all excess emissions. Complete a separate sheet for each monitor. Sequential numbering of each excess emission is recommended. For each excess emission, indicate: 1) time and duration, 2) nature and cause, and 3) action taken to correct the condition of excess emissions. Do not use computer reason codes for corrective actions or nature and cause; rather, be specific in the explanation. If no excess emissions occur during the quarter, it must be so stated.

PART 5 Use Table II as a guideline to report all CEM system upsets or malfunctions. Complete a separate sheet for each monitor. List the time, duration, nature and extent of problems, as well as the action taken to return the CEM system to proper operation. Do not use reason codes for nature, extent or corrective actions. Include normal calibrations and maintenance as prescribed by the monitor manufacturer. Do not include zero and span checks.

PART 6 Complete a separate sheet for each pollutant control device. Use Table III as a guideline to report operating status of control equipment during the excess emission. Follow the number sequence as recommended for excess emissions reporting. Report operating parameters consistent with Part 3, Subpart e.

PART 7 Complete a separate sheet for each monitor. Use Table IV as a guideline to summarize excess emissions and monitor availability.

PART 8 Have the person in charge of the overall system and reporting certify the validity of the report by signing in Part 8.

EXCESS EMISSIONS REPORT

PART 1

a. Emission Reporting Period ______________________________

b. Report Date ______________________________

c. Person Completing Report ______________________________

d. Plant Name ______________________________

e. Plant Location ______________________________

f. Person Responsible for Review and Integrity of Report ______________________________

g. Mailing Address for 1.f. ______________________________

h. Phone Number of 1.f. ______________________________

i. Total Time in Reporting Period ______________________________

j. Total Time Plant Operated During Quarter ______________________________

k. Permitted Allowable Emission Rates: Opacity ______________________________

SO2 ____________ NOx ____________ TRS ____________

l. Percent of Time Out of Compliance: Opacity ______________________________

SO2 ____________ NOx ____________ TRS ____________

m. Amount of Product Produced During Reporting Period ______________________________

n. Amount of Fuel Used During Reporting Period ______________________________

PART 2 – Monitor Information (Complete for each monitor).

a. Monitor Type (circle one): Opacity SO2 NOx O2 CO2 TRS Flow

b. Manufacturer ______________________________

c. Model No. ______________________________

d. Serial No. ______________________________

e. Automatic Calibration Value: Zero ____________ Span ____________

f. Date of Last Monitor Performance Test ______________________________

g. Percent of Time Monitor Available:

1) During reporting period ______________________________

2) During plant operation ______________________________

h. Monitor Repairs or Replaced Components Which Affected or Altered Calibration Values ________

____

i. Conversion Factor (f-Factor, etc.) ____

j. Location of monitor (e.g. control equipment outlet)_________________________________

PART 3 - Parameter Monitor of Process and Control Equipment. (Complete one sheet for each pollutant.)

a. Pollutant (circle one): Opacity SO2 NOx TRS

b. Type of Control Equipment ____

c. Control Equipment Operating Parameters (i.e., delta P, scrubber water flow rate, primary and secondary amps, spark rate)____

____

d. Date of Control Equipment Performance Test ________________________________

e. Control Equipment Operating Parameter During Performance Test __________________

____

____

____

____

PART 4 – Excess Emission (by Pollutant)

Use Table I: Complete table as per instructions. Complete one sheet for each monitor.

PART 5 – Continuous Monitoring System Operation Failures

Use Table II: Complete table as per instructions. Complete one sheet for each monitor.

PART 6 – Control Equipment Operation During Excess Emissions

Use Table III: Complete as per instructions. Complete one sheet for each pollutant control device.

PART 7 – Excess Emissions and CEMS performance Summary Report

Use Table IV: Complete one sheet for each monitor.

PART 8 – Certification for Report Integrity, by person in 1.f.

THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THE INFORMATION PROVIDED IN THE ABOVE REPORT IS COMPLETE AND ACCURATE.

SIGNATURE ____

NAME ____

TITLE ____

DATE ____

TABLE I

EXCESS EMISSIONS

Date	Time			Magnitude	Explanation/Corrective Action
	From	To	Duration		

TABLE II

CONTINUOUS MONITORING SYSTEM OPERATION FAILURES

Date	Time			Problem/Corrective Action
	From	To	Duration	

TABLE III

CONTROL EQUIPMENT OPERATION DURING EXCESS EMISSIONS

Date	Time			Operating Parameters	Corrective Action
	From	To	Duration		

TABLE IV

EXCESS EMISSIONS AND CEMS PERFORMANCE SUMMARY REPORT

Pollutant (circle one): SO_2 NOx TRS H_2S CO Opacity

Monitor ID ____

Emission data summary [1]	CEMS performance summary [1]
1. Duration of excess emissions in reporting period due to: a. Startup/shutdown b. Control equipment problems c. Process problems d. Other known causes e. Unknown causes 2. Total duration of excess emissions 3. $\frac{\text{Total duration of excess emissions}}{\text{Total time CEM operated}} \times 100 =$	1. CEMS[2] downtime in reporting due to: a. Monitor equipment malfunctions b. Non-monitor equipment malfunctions c. Quality assurance calibration d. Other known causes e. Unknown causes 2. Total CEMS downtime 3. $\frac{\text{Total CEMS downtime}}{\text{Total time source emitted}} \times 100 =$

1. For opacity, record all times in minutes. For gases, record all times in hours. Fractions are acceptable (e.g., 4.06 hours)
2. CEMS downtime shall be regarded as any time CEMS is not measuring emissions.

Permit Analysis
NorthWestern Energy
Permit #4255-00

I. Introduction/Process Description

NorthWestern Energy (NWE) proposes to construct a 200-Megawatt (MW) simple cycle, dual fuel-fired electrical power regulating facility located in the NW¼ of Section 17 and the SW ¼ of Section 8, Township 4 North, Range 10 West in Deer Lodge County, Montana.

A. Permitted Equipment

The Department of Environmental Quality (Department) received an initial application from NWE on August 22, 2008. The Department discussed incomplete items with the NWE and Bison Engineering on September 24, 2008. At that time, NWE requested a meeting rather than an incomplete letter from the Department. On October 2, 2008, the Department received a preliminary draft response from NWE with respect to the Department's incomplete items. Not all of the issues were addressed, and on October 31, 2008, the Department sent an incompleteness letter. On December 1, 2008, the Department received a revised permit application and after further correspondence, the application was deemed complete on December 10, 2008.

NWE has proposed to construct and operate a facility equipped with four simple-cycle, dual fuel-fired generating units. Each generating unit rated at 49.6 megawatts (MW) consists of two aeroderivative combustion turbines and one electric generator. The facility will serve as a regulating resource to stabilize the transmission grid due to historical supply and load variations, and the integration of non-dispatchable and unpredictable fluctuations from intermittent renewable resources, such as wind power. The facility's combined output will be approximately 200-MW power for delivery to the existing power grid.

B. Source Description

This facility, also known as the Mill Creek Generating Station (MCGS), will be located near the intersection of MT-1 and county road 273 approximately 3 miles southeast of Anaconda, Montana. MCGS will serve as NWE's regulating resource to maintain a balance between electrical loads (demand) and resources (supply) within NWE's Balancing Authority (BA) on a moment-to moment basis. NWE is required to maintain system frequency and minimize inadvertent energy transfers between adjacent BAs which is critical to the stability of the transmission grid. Keeping the system in balance at all times can be exacerbated by the addition of intermittent renewable resources such as wind generation.

In addition to the four simple-cycle generating units, other miscellaneous equipment would include: a 1,675 horsepower (hp) emergency diesel generator, a 308 hp emergency diesel fired water pump, two above-ground 1,000,000 gallon diesel fuel tanks and two 10,000 gallon aqueous ammonia tanks. Emissions from the facility will be controlled utilizing water injection, selective catalytic reduction (SCR) and catalytic oxidation (CO). NWE proposes phased construction of the facility.

NWE selected the rapid ramping simple-cycle FT8 Swiftpacs™ generating units from Pratt & Whitney. MCGS will utilize four generating units whereby each unit consists of a gas turbine flanked on each side of the common generator. NWE selected these units because they are capable of operating at various loads and temperatures with the ability to respond rapidly to fluctuations in wind conditions. The FT8 Swiftpacs™ are ideal for offsetting continuous variation between system generation and system load.

NWE also evaluated startup and shutdowns for the generating units. These are not typical startup and shutdowns as would be seen in other applications. This facility will have various forms of both a cold start and "windmill" startup. As the name implies, a cold start is when a turbine begins operation from non-operational to fuel firing. As such, these units are capable of generating full capacity in less than 10 minutes from a cold start. Windmill operation which is unique to these generating units, is when the one turbine is fully operational while the other spins freely or "windmills" without fuel. The system response to a windmill start, though rapid, is not immediate, and requires several minutes to reach peak control efficiencies. Therefore, no emission estimate distinctions are made in startup and shutdown emissions regarding cold or windmill starts.

MCGS would start and stop the turbines on a very routine basis, as much as, every 10 minutes depending on system demand and supply. In fact, normal operation for this facility would consist of approximately 40,000 startups and 40,000 shutdowns in any given year. Because the plant will not be operated at a continuously set load, emission limits were not based on full-load operation but rather represent the worse-case scenario based on the variable turbine loads, ambient temperatures and fuel types.

In general, a gas turbine is an internal combustion engine that operates with rotary rather than reciprocating motion. Within each combustion turbine unit, a mixture of compressed air and natural gas is fired in the combustor to produce compressed hot combustion gases. Expansion of these gases in the turbine rotates the turbine shaft that turns a generator to produce electricity.

For stationary applications, the hot combustion gases are directed through one or more fan-like turbine wheels to generate shaft horsepower. A simple cycle turbine is the most basic operating cycle of a gas turbine.

Generally, the compressor draws in ambient air and compresses it to a pressure of up to 30 times the ambient pressure. The compressed air is then directed to the combustor section where fuel is introduced, ignited, and burned. The hot combustion gases are then diluted with additional cool air from the compressor section and directed to the turbine section. Energy is recovered in the turbine section in the form of shaft horsepower; typically greater than 50 percent of the horsepower is required to drive the internal compressor section. The balance of the recovered shaft energy is available to drive the external load unit. The compressor and turbine sections can be a single fan-like wheel assembly, but are usually made up of a series of stages. The compressor and turbine sections may be associated with one or several connecting shafts. In a single shaft gas turbine, all compressor and turbine stages are fixed to a single continuous shaft and operate at the same speed.

C. Response to Public Comments

Person/Group Commenting	Permit Reference	Permittee Comment	Department Response
NorthWestern Energy	Section I.A. of the permit and Section I.A of the permit analysis	Page 1, Section 1.A, Paragraph 1 (and Page 1, Section 1.A of the Permit Analysis) states the following: "The facility will serve as a regulating resource to stabilize the transmission grid due to non-dispatchable and unpredictable fluctuations from intermittent renewable resources, such as wind power." NWE believes this sentence would be more complete if it were modified as follows (in both locations in the permit): "The facility will serve as a regulating resource to stabilize the transmission grid due to historical supply and load variations, and the integration of non-dispatchable and unpredictable fluctuations from intermittent renewable resources, such as wind power.	Corrected.
NorthWestern Energy	Section I.A.	Page 1, Section 1.A, Paragraph 2 reads, "Emissions from the facility will be controlled utilizing water injection, selective catalytic reduction (SCR) and catalytic oxidation (CO)." NWE requests the following change, "Emissions from the combustion turbine generating units will be controlled utilizing water injection, selective catalytic reduction (SCR) and catalytic oxidation (CO).	Corrected to reflect emissions from each generating unit.
NorthWestern Energy	Section II.A.3	Page 2, Section II.A.3, Paragraph 1 reads, "Each generating unit may only combust ultra-low fuel oil (#2) for up to 720 hours per year (ARM 17.8.752)." For purposes of clarity and consistency with the application, we request that the 720 hr/yr limit be applied per turbine, not per generating unit.	Corrected in Section II.A.3, II.D.2, Emission Inventory and clarification in Section IV. This change resulted in higher annual emissions for fuel oil for two reasons (1) calculations were based on natural gas operation for 8760 hours per year plus liquid fuel operation for up to 720 hours per year (per NWE); and (2) when MCGS operates on fuel oil, the emission factors provided were based on operation of the generating unit even though the facility has the potential to only operate one turbine--which would essentially half their emissions. The Department understands these emissions would be less than calculated, but did not have an emission factor to justify reducing the annual emissions.

Person/Group Commenting	Permit Reference	Permittee Comment	Department Response
NorthWestern Energy	Section II.A.21	Page 3, Section II.A.21, Paragraph 1 reads, "NWE shall comply with Section III, Conditions and Limitations during Commissioning Period, of this permit for a period of 16 weeks from initial startup of the generating units (ARM 17.8.749)." We appreciate that DEQ included this limitation in the permit as requested. However, the language above may be inadvertently too restrictive via its reference to "initial" startup. The permit application (Section 3.2.4) requested a "commissioning period" that included not only initial startup but also applicable permit limits "during generating unit installation and any maintenance that requires removal and/or replacement of a combustion turbine." Therefore, we request the language in the permit be modified as suggested below: "NWE shall comply with Section III, Conditions and Limitations during Commissioning Period, of this permit for a period of 16 weeks from initial startup of the generating units or any time following maintenance that requires removal and/or replacement of a combustion turbine (ARM 17.8.749)."	Corrected. Although the Department believes replacement and/or removal would have been covered when NWE began initial startup of the "new" unit.
NorthWestern Energy	Section I.B	Page 1, Section I.B. of the Permit Analysis (last sentence of the first paragraph) reads: "Keeping the system in balance at all times can be exacerbated by the addition of intermittent renewable resources such as wind generation, which is the predominant reason for proposing MCGS, a regulating resource." NWE proposed the following: Keeping the system in balance at all times can be exacerbated by the addition of intermittent renewable resources such as wind generation.	Corrected.
NorthWestern Energy	Section IV of the Permit Analysis	Page 19 of the Permit Analysis, Section IV, has a typographical error. The natural gas lower heating value should be 19,367 not 919,367 Btu/lb	Corrected.
NorthWestern Energy	Section IV of the Permit Analysis	Page 20 of the Permit Analysis, Section IV, Fuel Oil Calculations: all references to "natural gas" should be changed to "fuel oil" in this section.	Corrected.

Person/Group Commenting	Permit Reference	Permittee Comment	Department Response
NorthWestern Energy	Environmental Assessment, Section B	Page 34 of the Permit Analysis, Section B of SUMMARY OF COMMENTS ON POTENTIAL SOCIAL AND ECONOMIC EFFECTS, Sentence 2 reads, "An existing electrical substation would co-locate on the facility property, and a gravel pit would be located north of the property." This statement is potentially misleading. The applicant wishes to clarify that the gravel pit located north of the property is an existing industry not related to the generating station.	Corrected.
NorthWestern Energy	Environmental Assessment, Section L	Page 37 of the Permit Analysis, Section L includes reference to "BCP" and this should be "MCGS."	Corrected.
NorthWestern Energy	Environmental Assessment under the section titled: "Other groups or agencies contacted or which may have overlapping jurisdiction"	Page 37 of the Permit Analysis, "Section, Last sentence reads, "In addition, NWE hosted a public meeting at the Anaconda High School on October 14, 2008 where few negative comments resulted—most were opponents of the project." Opponents should be changed to proponents.	Corrected

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   NWE shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

NWE must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into an outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of 20% for all fugitive emission sources and reasonable precautions be taken to control emissions of airborne particulate. (2) Under this rule, NWE shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. (4) Commencing July 1, 1972, no person shall burn liquid or solid fuels containing sulfur in excess of 1 pound of sulfur per million Btu fired. (5) Commencing July 1, 1971, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions. NWE will combust pipeline quality gas (0.0017% sulfur by weight) or ultra low sulfur fuel oil (sulfur content less than 0.0015%) which will meet this limitation.

5. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

6. ARM 17.8.340 Standard of Performance for New Stationary Sources. This section incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). NWE's generating units are considered NSPS affected facilities under 40 CFR Part 60 and are subject to the requirements of the following subparts:

- 40 CFR 60, Subpart A – General Provisions apply to all equipment or facilities subject to an NSPS Subpart as listed below.

- 40 CFR 60, Subpart GG Standards of Performance for Stationary Gas Turbines. This subpart does not apply to the generating units because the turbines are subject to Subpart KKKK. Otherwise, the turbines would be subject to Subpart GG because they were constructed after October 3, 1977, and because the turbines will have a heat input capacity of greater than 10.7 gigajoules per hour.

- 40 CFR 60, Subpart KKKK Standards of Performance for Stationary Combustion Turbines. This subpart applies to the generating units because they are stationary combustion turbines with a heat input at peak load equal to or greater than 10 MMBTU/hr that commenced construction, modification, or reconstruction after February 18, 2005.

- 40 CFR 60, Subpart Kb Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage). This subpart applies to storage vessels with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 23, 1984. Storage vessels with a capacity greater than or equal to 151 m^3 (39,890 gallons) storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) are exempt from this requirement. Although the storage vessel for NWE has a capacity greater than 75 m^3, NWE proposes to only store #2 distillate fuel oil with a vapor pressure of 0.152 kPa and therefore this Subpart does not apply.

- 40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition (CI) Combustion Engines (ICE). This subpart indicates that NSPS requirements apply to owners or operators of stationary CI ICE that commence construction after July 11, 2005, or are manufactured after April 1, 2006. This subpart also applies to fire pump engines manufactured and certified by the National Fire Protection Association (NFPA) after July 1, 2006. This subpart could apply to the proposed emergency generator/engine and the fire pump depending upon the manufacture date.

4. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. This section incorporates, by reference, 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAP). Since the emission of Hazardous Air Pollutants (HAP) from the NWE facility is less than 10 tons per year for any individual HAP and less than 25 tons per year for all HAPs combined, the NWE facility is not subject to the provisions of 40 CFR Part 61.

5. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This section incorporates, by reference, 40 CFR Part 63, NESHAP for Source Categories. When the emission of HAP from a facility is less than 10 tons per year for any individual HAP and less than 25 tons per year for all HAP combined, the facility is not subject to the provisions of 40 CFR Part 63.

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.402 Requirements. NWE must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed height of the new or altered stack will be below the allowable 65-meter GEP stack height.

E. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. NWE submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

F. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter, or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year of any pollutant. NWE has a PTE greater than 25 tons per year of particulate matter (PM), PM with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), PM with an aerodynamic diameter of 10 microns or less (PM_{10}), oxides of nitrogen (NO_x), and carbon monoxide (CO); therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. NWE submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. NWE submitted an affidavit of publication of public notice for the August 27, 2008, issue of the *Anaconda Leader* and the August 22, 2008, issue of *The Montana Standard*, a newspaper of general circulation in the town of Anaconda and Butte, as proof of compliance with the public notice requirements. NWE also re-published an affidavit of publication of public notice for the December 9, 2008, issue of the *Anaconda Leader* and the December 2, 2008, issue of *The Montana Standard.*

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that Best Available Control Technology (BACT) shall be utilized. The BACT analysis is discussed in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving NWE of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction has commenced (begin or contractual obligations entered into that would constitute substantial loss) within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The

owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

G. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

   The facility is not a "listed facility" and the potential to emit (PTE) is less than 250 tons per year of any pollutant (excluding fugitive emissions). Therefore, NWE facility is not deemed a major stationary source and is not subject to review under the PSD program.

H. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. PTE > 100 tons per year (tpy) of any pollutant;

   b. PTE > 10 tpy of any one HAP, PTE > 25 tpy of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tpy of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #4255-00 for NWE, the following conclusions were made:

   a. The facility's PTE is > 100 tpy for several criteria pollutants.

   b. The facility's PTE is < 10 tpy for any one HAP and < 25 tpy for all HAPs.

   c. This source is not located in a serious PM_{10} nonattainment area.

   d. This facility is subject to a current NSPS standard (40 CFR 60 Subpart KKKK, and potentially subject to Subpart IIII).

e. This facility is not subject to a current NESHAP standard.

f. This source is a Title IV affected source.

g. This source is an EPA designated Title V source.

Based on these facts, the Department determined that NWE is subject to the Title V operating permit program.

III. BACT Determination

A BACT determination is required for each new or altered source. NWE shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized. NWE submitted the required BACT analysis with Permit Application #4255-00.

The Department reviewed NWE's BACT analysis which addressed available methods of controlling NOx, SO_2, PM/PM_{10}, $PM_{2.5}$, CO, and VOC emissions from, as well as previous BACT determinations (via the RACT/BACT/LAER Clearinghouse and state agency decisions). Due to the variable nature of this facility where a rapid-ramping combustion turbine is necessary, a combined-cycle combustion turbine was not evaluated. Combined-cycle combustion turbine requires additional time to reach equilibrium and would not work effectively in this situation.

For this facility and BACT analysis, the proposed emission limits include startup and shutdowns for the generating units. These are not typical startup and shutdowns as would be seen in other applications. This facility will have various forms of both a cold start and "windmill" startup. As the name implies, a cold start is when a turbine begins operation from non-operational to fuel firing. As such, these units are capable of generating full capacity in less than 10 minutes from a cold start. Windmill operation which is unique to these generating units, is when the one turbine is fully operational while the other spins freely or "windmills" without fuel use. NWE has stated that while there appears to be some mechanical deficiencies associated with a windmill start versus a cold start, the emission estimates are essentially the same for both conditions. The added airflow from the starting turbine upsets any equilibrium in the controls system, forcing the active portions of the controls (namely the ammonia injection grid) to begin compensating for the additional exhaust gases generated by the windmill starting turbine. The system response to a windmill start, though rapid, is not immediate, and requires several minutes to reach peak control efficiencies. Therefore, no emission estimate distinctions are made in startup and shutdown emissions regarding cold or windmill starts.

NWE has assumed that the emission values would be the same for both situations and no distinctions were made. MCGS would start and stop the turbines on a very routine basis, as much as, every 10 minutes depending on system demand and supply. In fact, normal operation for this facility would consist of approximately 40,000 startups and 40,000 shutdowns in any given year. Because the plant will not be operated at a continuously set load, emission limits were not based on full-load operation but rather represent the worse-case scenario based on the variable turbine loads, ambient temperatures and fuel types. NWE evaluated approximately 24 different operating scenarios in order to provide potential emission limits given all conditions.

Given this information, the following control options have been reviewed by the Department in order to make this BACT determination.

A. NOx BACT for the simple cycle generating units:

For NOx emissions, this analysis includes proper operation and design, water injection, fuel selection, dry low NOx burners, selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), wet chemistry scrubber, NO_x scrubber, and innovative catalytic systems. A summary of the analysis of these controls is shown below.

As an introduction to the detailed discussion of NO_X control technologies, it is useful to review two primary mechanisms for formation of NOx which are thermal NOx and fuel NOx. Thermal NOx refers to the NOx formed through high-temperature oxidation of the nitrogen found in the combustion air. The primary factors contributing to an increased thermal NOx formation rate are the same factors contributing to complete combustion of fuel: combustion temperature, residence time, and mixing or turbulence. Regardless of the fuel being combusted, thermal NOx generally becomes a significant factor at significantly high combustion temperatures. For fuels with relatively low nitrogen content, such as natural gas, thermal NOx is the primary NOx formation mechanism.

Fuel NOx refers to the NOx formed by the conversion of fuel-bound nitrogen to NOx during combustion. Fuel NOx accounts for a major portion of the total NOx emissions from the combustion of nitrogen containing fuels, such as coal and wood waste. A variety of factors, including the combustion temperature, fuel-air stoichiometric ratio, and coal/wood waste characteristics (moisture, volatile matter, and nitrogen) are believed to contribute to the fuel NOx formation mechanism.

1. Proper System Operation and Design

   Fuel costs and energy conservation were considered when designing the MCGS facility. The FT8 Swiftpact™ chosen by NWE consist of 2 combustion turbines on a common driveshaft turning one generator. This design allows one turbine to "windmill" or spin without fuel use, while the other turbine is operating. Although there is a slight decrease in fuel efficiency, the emissions are significantly reduced because only one turbine is operating at low load conditions. NWE proposes to operate these turbines in order to maximize efficiency and to minimize idling; thereby reducing the emissions and increasing the amount of electricity produced per unit of fuel.

2. Water injection

   Water or steam injection technology has been demonstrated to suppress NOx emissions by injecting water or steam into the turbine. Injection of the fluid increases the thermal mass by dilution and reduces peak temperatures in the flame zone. NOx reduction efficiency increases as the water-to-fuel ratio increases. For maximum efficiency, the water must be atomized and injected with homogeneous mixing throughout the combustor. This technique reduces the thermal NOx, but may actually increase the production of fuel NOx. Both CO and VOC emissions may also increase while using water injection. However, depending on the initial NOx concentrations, wet injection may reduce NOx emissions by 60% or more.

3. Fuel selection

   MCGS proposes to operate the facility primarily on natural gas with ultra low sulfur fuel oil (#2) as a back-up during service interruption or when the demand for natural gas is extreme. When natural gas is used, power output and thermal efficiency of the generating units are generally higher than when using most liquid fuels. For natural gas combustion the NOx formed is primarily thermal NOx. Generally, fuel oils have low levels of fuel-bound nitrogen and in most cases, also result in thermal NOx. Emissions are usually higher for liquid fuel oils. Therefore, NWE proposes to use pipeline quality natural gas with fuel oil only as a back up. The use of fuel oil would be limited in the permit to 720 hours/year or less.

4. SCR

SCR is a post-combustion gas treatment technique for the reduction of nitric oxide (NO) and nitrogen dioxide (NO_2) in the engine exhaust stream to molecular nitrogen, water, and oxygen. In the SCR process, aqueous or anhydrous ammonia (NH_3) or urea is used as a reducing agent, and is injected into the flue gas upstream of the catalyst bed. NOx and NH_3 combine at the catalyst surface, forming an ammonium salt intermediate that subsequently decomposes to produce elemental nitrogen and water. Catalysts typically are made up of a noble metal, a base metal oxide, or zeolite based material. Usually the catalyst is installed upstream of any particulate control device. In most instances, a metal-based catalyst is used in cogeneration or combined cycle applications.

SCR works best for flue gas temperatures between 450°F and 850°F, when a minimum amount of O_2 is present. The use of zeolite catalyst can extend the upper temperature range to a maximum of 1100°F. A typical temperatures range for these units is 630° to 970°F depending on operating conditions and therefore, SCR could be applicable to this facility.

According to (AP-42, Section 1.4.4), the control efficiency for an SCR is estimated between 65% and 90%. Technical factors that impact the effectiveness of this technology include inlet NOx concentrations, the catalyst reactor design, operating temperatures and stability, type of fuel fired, sulfur content of the fuel, design of the ammonia injection system, catalyst age and reactivity, and the potential for catalyst poisoning.

5. SNCR

SNCR involves the noncatalytic decomposition of NOx in the flue gas to nitrogen and water using a reducing agent (e.g., ammonia or urea). The reactions take place at much higher temperatures than in an SCR, typically between 1,650°F and 1,800°F, because a catalyst is not used to drive the reaction. The efficiency of the conversion process diminishes quickly when operated outside the optimum temperature band and additional ammonia slip or excess NOx emissions may result. The estimated control efficiency for SNCR on the proposed process is 40%-60%.

With an exit gas temperature of approximately 630° to 970°F, the use of SNCR with the generating units would require additional heating of the gas stream. The additional heating of the gas stream would result in additional pollutants and would drive up the cost per ton of reduction of air emissions. Furthermore, the residence time that is required for the reaction to occur using SNCR is generally longer than can be accommodated by the exit velocity of a gas turbine. Because of the high cost per ton of reduction from this technology in comparison to the base case, the potential for increased air emissions, and the technical difficulties of using this control technology, the Department determined that SNCR does not constitute BACT in this case.

6. Dry Low NOx Burner

Similar to water injection, the purpose of dry low NOx burners is to lower the combustion temperature in the turbine, thereby reducing thermal NOx formation. This is accomplished by lean pre-mixing of fuel and combustion air prior to entry into the compressor, and injecting fuel in stages throughout the flow path in the combustion turbine. This produces a lower heating value gas/fuel mixture that will then combust at lower temperatures, reducing thermal NOx. Dry Low NOx Burners have lower efficiency than SCRs (approximately 44% – 90% and the Department determined that the use of dry low NOx burners does not constitute BACT in this case.

7. Scrubber Technologies

A scrubbing system consists of several stages. The stages include converting NO to NO_2, and quenching the NO_2 to induce chemical reactions in an aqueous stage. Chemical reactions are carried out in subsequent stages in order to break down NO_2. The system requires chemical reagents and water treatment or chemical disposal provisions, and there is no standard model for this system. The number of reagents and treatment requirements varies depending on design. The estimated control efficiency is approximately 80%.

Because of the limitations with using scrubbers and because the SCR unit will result in lower NOx emissions than wet chemistry scrubbers, and the fact that SCR has been proven to work on other turbines, the Department determined that wet chemistry does not constitute BACT in this case.

8. Innovative Catalytic Systems

Innovative catalytic technologies such as SCONOX and XONON integrate catalytic oxidation and absorption technology. In the SCONOX process, CO and NO are catalytically oxidized to CO_2 and NOx. Subsequently, the NO_2 molecules are absorbed on the treated surface of the SCONOX catalyst. SCONOX technology is normally applicable for combined cycle turbine generation facilities since steam is required in the process. HAPs may increase from the SCONOX technology. SCONOx™ is designed to reduce oxide of nitrogen emissions from natural gas-fired turbine engines operating in a range of 300°F to 700°F. A typical temperatures range for the proposed units is 630° to 970°F depending upon operating conditions, thereby eliminating SCONOx™ from further consideration.

The XONON system is applicable to diffusion and lean-premix combustors. It utilizes a flameless combustion system where fuel and air react on a catalyst surface, preventing the formation of NOx while achieving low CO levels. The overall combustion system consists of the partial combustion of the fuel in the catalyst module followed by completion of combustion downstream of the catalyst. Initial partial combustion produces no NOx and downstream combustion occurs in a flameless homogeneous reaction that produces almost no NOx. The system is totally contained within the combustor and is not an add-on process for clean up of the turbine exhaust.

XONON, originally developed by Catalytica Energy Systems, and now licensed to Kawasaki Heavy Industries, reduces NOx emissions by lowering the combustion temperature inside of the turbine. However, this technology has not been demonstrated on larger gas turbines, and is currently unavailable in sizes that support the generation needs of this facility.

The SCONOX and XONON technologies have not been typically applied to simple cycle turbine generating units. Because of the questions and concerns on the effectiveness of using this control technology, questions on the applicability of the technology, and the overall cost of using this technology, the Department determined that innovative catalytic systems do not constitute BACT in this case.

For units similar to those described in NWE's application, the catalytic control of NOx emissions were reported at 25 parts per million (ppm). In other States, SCR with similar aeroderivative units that utilize SCR with water injection to control NOx show emissions as low as 5 ppm, and were actually tested below these values. A review of EPA's RBLC indicates that for recently permitted FT8 Swiftpac™ simple cycle units utilizing wet injection coupled with SCR results in a normalized emission limit value of 3.5 ppmvd (corrected to 15% O_2) as BACT for NOx at full load, steady state operations.

In this case, NWE has estimated an emission limit of 3.7 ppm for operations at full load, steady state conditions. However normal operations for this facility include moment-to moment fluctuations in operating conditions, startups and shutdowns, changes in ambient temperatures, fuel and loads. Therefore, higher emission limits were proposed to cover all operating scenarios including:

NWE and their vendor have estimated that by coupling the rated SCR efficiency of 86% with the 37 ppm water injection control concentration (natural gas) and 42 ppm water injection control concentration (natural gas) would result in a NOx concentration based emission rate of 5 ppm which equates to approximately 11.07 lb/hr (natural gas) and 10.09 lb/hr (fuel oil).

Given the variable operation the turbines NWE has proposed that the emission limit be based on a 30-day rolling average. The Department determined that utilizing SCR with wet injection coupled with the use of clean fuels, and proper operation and design constitutes BACT. The BACT emission limits for NOx will be 11.07 lb/hr using natural gas and 10.09 lb/hr using fuel oil, both limits will be based on a 30-day rolling average.

B. CO and VOC BACT for the simple cycle generating units:

For CO and VOC emissions, this analysis includes proper operation and design, thermal oxidation, and catalytic oxidation. A summary of the analysis and these controls is included below.

As an introduction to the detailed discussion of CO control technologies, it is useful first to review CO and VOCs. Both VOCs and CO are formed from incomplete combustion and consequently, both will be addressed in this section. Generally speaking, CO and VOC emissions are highest when the turbine idles for extended periods of time. A gas turbine operating at full load experiences high efficiencies and a reduction of CO. A gas turbine operating at light to medium load experiences reduced fuel efficiencies, incomplete combustion, and an increase in CO. Due to the unique operating characteristics of this regulating facility, the turbines will operate at variable loads, including very low loads, to react to energy demands.

Complete combustion or oxidation of organics results in the emission of water and CO_2. This reaction is slower compared to most hydrocarbon reactions. When organic compounds do not oxidize completely, the result is CO emissions and various modified organic compounds. Two general and nonexclusive approaches are available for reducing emissions of these compounds:

· Improve combustion conditions to facilitate complete combustion in the turbine burner.
· Complete oxidation of the exhaust stream after it leaves the turbine burner.

1. Proper Operation and Design

MCGS would serve as NWE's regulating resource to maintain a balance between electrical loads (demand) and resources (supply) on a moment-to moment basis. This facility will need to continuously compensate for the variation in load and supply, primarily due to wind generation. Again, the configuration of these units where the generator is driven by two combustion turbines allows one turbine to operate while the other is "windmilling" for extended periods of time. CO and VOC emissions are effectively reduced by only operating one turbine. Because of the nature of the facility's variable operation, the generating units cannot be continuously operated at maximum efficiency, when combustion is more complete. However, NWE proposes to operate the turbines to minimize CO and VOC emissions, within the confines of the operational characteristics of a generation facility used for regulating service.

2. Thermal Oxidation

Oxidation controls break down the molecular structure of an organic compound into CO_2 and water vapor. Temperature, residence time, and turbulence of the system affect CO control efficiency. Incinerators or oxidizers have the potential for very high CO control efficiency; however, this efficiency comes at the expense of potentially increasing NOx production.

The catalyst systems generally use metal oxides such as nickel oxide, copper oxide, manganese oxide, or chromium oxide. Thermal oxidizers require high temperatures of approximately 1800°F to 2000°F. As a result of the high temperatures required for complete destruction, fuel costs can be expensive and fuel consumption can be excessive with oxidation units.

Thermal oxidizers are usually located downstream of a particulate control device, especially when the exhaust stream contains high concentrations of particulate material. Reduced particulate loading improves thermal efficiency since the particulate matter would act as a heat sink, and it reduces equipment maintenance requirements. Several design variations address different inlet concentrations, air flow rates, fuel efficiency requirements, and other operational variables; however all of them function using the same basic principles. According to NWE's vendor, thermal oxidizers are capable of reducing CO emissions by up to 90 percent and VOC emissions by 50%. Because NWE's generating units typically operate at temperatures ranges from 630° to 970°F (depending upon operating conditions), the use of Thermal oxidation would require additional heating of the gas stream and would drive up the cost per ton of reduction of air emissions. Therefore, the Department determined that thermal oxidation does not constitute BACT in this case

3. Catalytic Oxidation

Catalytic oxidizers employ the same principles as thermal oxidizers, but they use catalysts to lower the temperature required to effect complete oxidation. The optimum temperature range for catalytic oxidizers is generally 600°F to 900°F. Catalysts are prone to plugging and poisoning, and must be located downstream of a particulate control device (if the exhaust stream contains appreciable concentrations of particulate matter). Even so, contaminants that are not removed by the particulate control equipment, or those that are not removed in sufficient quantity, can potentially poison the catalyst and reduce or eliminate its effectiveness.

The NWE generation units propose to combust clean fuels (natural gas and ultra low-sulfur fuel oil) and particulate loading should not be a problem. Like thermal oxidizers, catalytic oxidizer designs include many varieties to address specific operational conditions and requirements. These units are generally capable of 85 to 95 percent destruction or removal efficiency at steady state conditions. For this application, NWE proposes to install catalytic oxidation and the turbine vendor has estimated the average control efficiency of CO to be at 89%. Because the incinerator was designed and installed to primarily control CO, the VOC efficiency is much less. The vendor has conservatively estimated VOC removal at 30%.

NWE has determined that catalytic oxidation is more cost effective ($3000/ton of CO and VOC removed) than thermal oxidation ($15,300/ton of CO and VOC removed). A review of EPA's RBLC database for existing FT8 Swiftpacs™ indicates a BACT emission rate of 10 ppm for catalytic oxidation at steady-state conditions. Alternatively, single turbines of similar size perform at approximately 6 ppm. According to the applicant and the vendor, with steady-state, full load conditions, at the average yearly temperature of 39.5°F, MCGS emissions will be as low as 2 ppm for both natural gas and liquid fuels. In this case, the MCGS turbine vendor has estimated an emission limit of 3.7 ppm for operations at full load, steady state conditions. However, because these generation units will rarely operate consistently at state-state conditions, the emission limit was proposed higher to cover all operating scenarios including: startups and shutdowns, changes in ambient temperatures and loads.

The Department has determined that utilizing catalytic oxidation with the use of clean fuels and proper operation and design constitutes BACT. The BACT emission limits for CO will be 10.78 lb/hr using natural gas and 9.83 lb/hr using fuel oil, both emission limits will be based on a 30-day rolling average. The BACT emission limits for VOC will be 2.47 lb/hr using natural gas and 18.98 lb/hr using fuel oil, and both limits will be based on a 30-day rolling average.

C. $PM/PM_{2.5}/PM_{10}$ Emissions for the simple cycle generating units

Particulate matter (PM) which includes total particulate, PM_{10} and $PM_{2.5}$ emissions from the generating units primarily originate from ash and sulfur contained within the fuel. However, filterable PM emissions are inherently low when combusting natural gas.

NWE evaluated emissions of secondary aerosol precursors (e.g. NOx, SO_2, NH_3, VOC) that contribute to ambient $PM_{2.5}$. However, most of the secondary precursors are criteria pollutants such as SO_2, NOx and VOCs and have already been evaluated and controlled with add-on technologies. Therefore, they were not further evaluated in this section.

The only remaining potential secondary precursor is ammonia and while NWE acknowledges that ammonia is emitted in very small quantities as a result of incomplete reaction in the SCR catalyst; ammonia is generally presumed to be insignificant. NWE assumed all primary sulfate emitted from the turbines and sulfate converted via the CO and SCR catalysts was assumed to react with available ammonia from the SCR to form ammonium sulfate. This will likely overestimate emissions of $PM_{2.5}$.

1. Electrostatic Precipitators (ESP), both wet and dry

An ESP uses electric forces to remove particles (dry dust or liquid droplets) from a gas stream onto collection plates. Particles are given an electric charge by forcing them to pass through the corona that surrounds a highly charged electrode. The electrical field forces the charged particles to the walls from the electrodes maintained at high voltage in the center of the flow lane. An electrical field forces the charged particles to the opposite charged electrode, usually a plate and solid particles are removed from the collection electrode by a shaking process known as "rapping."

ESPs can be configured in several ways and the types of ESPs that NWE evaluated, include: plate wire precipitator, flat plate precipitator, tubular precipitator, wet precipitator and the two-stage precipitator.

NWE found that with the exception of the plate-wire precipitator most can't handle large volumes of gas required for the proposed generating units. The flat wire precipitator designed to use flat plates instead of wires for high voltage electrodes usually handles gas flows ranging from 100,000 to 200,000 actual cubic feet per minute (acfm). Tubular precipitators are typically parallel tubes with electrodes running along the axis of the tubes and have typical applications in sulfuric acid plants, coke oven byproduct gas cleaning, and steel sinter plant. Wet precipitators can be used as discussed above but with wet walls. The advantage of wet precipitators is that particles are not re-entrained due to the rapping of the walls, but the disadvantage is the complexity of the wash and handling and disposal of the slurry. Finally, the two-stage precipitators are in parallel and are designed for indoor application with low gas flow (less than 50,000 acfm) and submicrometer sources, such as sources emitting oil mists, smokes, fumes and other sticky particulate.

Generally speaking, an ESP can achieve very high collection efficiencies and can handle relatively large gas volumes. Disadvantages of utilizing an ESP include high capital cost, little operational flexibility, and overall size of the equipment. For this facility flow rates, temperatures, and particulate loadings will vary significantly making it difficult to treat the gas stream. In addition, an ESP is not listed as a particulate control device for any combustion turbine found in the RBLC database. Therefore, the Department has determined that an ESP is not feasible for this application and does not constitute BACT.

2. Centrifugal collectors

   Centrifugal, or cyclone, precipitators are used as a "prefilter" before the primary particulate control device. Generally, cyclones are effective in reducing high volumes with relatively large particulate (greater than 10 micron in size). Because this analysis concerns particulate significantly smaller than 10 microns, the Department determined that centrifugal collectors do not constitute BACT in this case.

3. Fabric filters (baghouses) with specialty bags

   A baghouse consists of one or more isolated compartments containing rows of fabric filter bags or tubes. The gas stream passes through the fabric filter, where particulate is retained on the upstream face of the bags, while the remaining gas stream is vented to the atmosphere or to another pollution control device. Filtering is accomplished through a combination of inertial impaction, impingement, and accumulated dust cake sieving. The particulate collected is removed from the filters with pneumatic pulses, or by mechanical shakers.

   Baghouses collect particle sizes ranging from submicron to several hundred microns at gas temperatures of up to approximately 500°F. Specialty bags are required for stack temperatures above this and can be used to achieve lower particulate emission rates. However, specialty bags cost significantly more than standard bags. While bags can be obtained capable of handling high temperature gas streams (above 500°F), such as intrinsically coated and membrane bags, the cost effectiveness of installing these specialty bags would be cost prohibitive and well above industry norms for this application. In addition, a combustion turbine with a baghouse was not found as a particulate control device in the RBLC database. Based on these reasons and the fact that a baghouse using specialty bags would cost $992,000 per ton (per generating unit) of PM and PM_{10} removed, a baghouse does not constitute BACT to control particulate emissions from these generation units.

4. Wet Scrubbers

   Wet scrubbers typically use water to impact, intercept, or diffuse a particulate-laden gas stream. There are several types of scrubbers available; however, many if not all, use impaction, where particulate matter is accelerated and impacted onto a surface area or into a liquid droplet through devices such as venturis and spray chambers. For scrubbers using interception, the particles flow nearly parallel to the water droplets and allows the water to intercept the particles. Diffusion is used for particles smaller than 0.5 microns where there is a high temperature difference between the gas and the scrubbing liquid.

NWE has estimated that each Swiftpac^{TM} would require approximately 21,000 gallons of water per minute to scrub large volume of exhaust gas produced. In addition RBLC does not list scrubbers as a control technology for turbines, and according to the OAQPS Cost Control manual, existing wet scrubbers designed for PM control support exhaust flow rates significantly below the flows expected from these turbines.

The Department has determined that using a wet scrubber would result in additional environmental concerns, most notably, the large volume of water necessary to support each Swiftpac^{TM} and the large amount of wastewater that would result from the process. In addition, the cost effectiveness of this technology would be greater than industry norms due to the high cost of the control technology and the relatively low uncontrolled emissions of particulate matter. For these reasons, a wet scrubber does not constitute BACT for particulate emissions from the generation units.

5. Fuel Selection

The MCGS facility proposes to operate primarily on natural gas with ultra low sulfur fuel (#2) oil as a back-up during service interruption or when the demand for natural gas is extreme. For both fuels, the majority of $PM_{2.5}$ emissions is ammonium sulfate $(NH_4)_2SO_4$. Because the Department has determined that an SCR to control NOx control is BACT, the result would be that aqueous ammonia required for the SCR would react with available fuel sulfur (in the form of converted sulfate) to form ammonium sulfate. The reaction for this formation is detailed below:

$$SO_2 + \text{Catalyst (CO and SCR)} + bH_2O \rightarrow cH_2SO_4$$
$$NH_3 + eH_2SO_4 \rightarrow f(NH_4)_2SO_4$$

The turbine vendor has provided the fractionation of primary SO_2 and SO_3 emissions from the turbine and provided the proportion of SO_2 that is expected to be oxidized to SO_3 by the SCR and CO oxidation catalysts. For this analysis, NWE assumed all primary and converted SO_3 rapidly oxidizes to SO_4 and is available as ammonium sulfate formation before the stack outlet. The selection of pipeline quality natural gas and ultralow sulfur liquid fuels significantly reduces the fuel sulfur content, thus removing the majority of the $PM_{2.5}$ precursors. NWE proposes to only use ultra low sulfur liquid fuels as backup (up to 720 hours) and will be permitted as such.

6. No Additional Controls

The high volumetric flow rate of gas through the turbines, with relatively low particulate loading, makes the total annual cost of control equipment cost prohibitive. For these reasons and the reasons stated above, "no additional control" will constitute BACT for the generating units.

The Department has determined that a maximum $PM/PM_{10}/PM_{2.5}$ emission limit of 7.30 lb/hr/Swiftpac^{TM} when operating on pipeline quality natural gas, and an emission limit of 19.30 lb/hr/Swiftpac^{TM} when operating on ultra low sulfur fuel oil based on a 30-day rolling average constitutes BACT. This can be achieved through the use of proper operation and design of the generating units coupled with the use of clean fuels. These BACT values were based on information from NWE's vendor and the fact that the assumptive formation of ammonium sulfate prior to stack exhaust were added to the vendor-provided emission rates; no PM is generated within the combustion turbine itself; and all PM originates from the fuel, inlet combustion air, and exhaust tempering air.

D. SO_2 Emissions

SO_2 emissions from combustion turbines can be limited using low sulfur fuels. For facilities using natural gas and ultralow sulfur diesel, sulfur is present as an organic sulfur compound. In this form it is readily volatilized under combustion conditions, and oxidized by the oxygen present in combustion and exhaust air to SO_2. SO_2 emissions can be reduced by limiting or preventing SO_2 formation and by capturing then converting it once it has formed. The following technologies were evaluated for controlling SO_2:

1. Proper turbine design and operation

   Fuel costs are a major portion of the cost of electricity generation and consequently, NWE plans to make every effort to conserve energy and reduce costs. By maximizing fuel efficiency the system can reduce pollutant emissions; increase the amount of electricity produced per unit of fuel and decrease the amount of combustion-related pollutants emitted. However, this must be balanced with operating characteristics of the equipment and load behavior of the electrical network served by the proposed facility.

   NWE has determined that combined cycle combustion turbine would not be feasible due to the required time to reach equilibrium. MCGS would experience varying loads and NWE has determined that a rapid-ramping combustion turbine is necessary for this facility.

   NWE would operate these generating units to maximize efficiency and minimize idling, when possible, because unnecessary idling leads to increased emissions and wasted fuel. After evaluating several options, NWE specifically selected the rapid-ramping Pratt & Whitney Power Systems (PWPS) FT8 Swiftpac™ combustion turbines because these generating units provide the option of powering-down when loads are insufficient to permit maximum efficient operation--regardless of system load.

   This generating unit (two turbines and one generator) allows one turbine to "windmill," or spin without fuel use, while firing the other turbine. This essentially reduces the emissions in half when operating at low loads. However, there is a slight decrease in fuel efficiency as the windmilling turbine continues to present small parasitic friction losses to the other turbine. The reduction in emissions when operating at the low loads, required of this facility, compensates for any efficiency losses.

2. Fuel Selection

   The fuel used to fire the combustion turbines is the primary source of sulfur, and ultimately, of SO_2. Pipeline quality natural gas and ultralow sulfur diesel fuel contain very little sulfur. Whereas many combustion turbines fire 500 ppm sulfur No. 2 fuel oil, or 150 ppm diesel as their liquid fuel, MCGS will fire 15 ppm ultralow sulfur diesel. This would significantly reduce sulfur emissions when combusting pipeline quality natural gas and ultralow sulfur liquid fuels in a simple cycle combustion turbine. In addition, NWE would only use the ultro low sulfur liquid fuels as backup and would be limited to less than 720 hours per year.

3. Supplemental Scrubbing

   It is possible that the exhaust gases could be exposed to additional scrubbing following the SCR to remove additional SO_2. There are many reagents available; however a large majority of flue gas scrubbers use either lime or limestone. Mixing techniques vary but generally fall into two main categories: wet systems and dry systems. Wet systems use slurry that is typically brought into contact with the flue gas in a scrubber spray tower or packed bed. Dry systems spray or atomize the reagent into the flue gas stream to achieve the required contact. Many dry systems are actually referred to as semi-dry systems, and inject a high-solids slurry into a spray chamber where it contacts the flue gas stream. The hot flue gas vaporizes the water, leaving a dry particulate which either settles out in the spray chamber or is entrained in the flue gas stream and captured by a downstream particulate control device. Given that there are no known applications of SO_2 scrubbing for combustion turbines and the fact that the SO_2 emissions from the MCGS facility are relatively minor at 14.54 tpy; supplemental scrubbing would add little benefit and was removed from further consideration.

4. Chemical Absorption

Aqueous chemical systems have been successfully employed in various industries to remove SO_2 from concentrated waste streams. These systems are similar to the dry scrubbers except they use aqueous solutions or slurries as the contact and reaction media. Two examples of such systems are the double alkali method and the commercial Tri-NOx Multi-Chem® scrubber (by Tri-Mer Corporation). No applications of chemical SO_2 absorption can be found for combustion turbines. Given that there are no known applications of chemical absorption for combustion turbines and the fact that the SO_2 emissions from the MCGS facility are relatively minor at 14.54 tpy; chemical absorption was removed from further consideration.

SO_2 emissions from the MCGS facility are relatively minor at 14.54 tpy. NWE proposed combusting only pipeline quality natural gas (with ultra low sulfur fuel oil (#2) as back up) coupled with proper operation and design as BACT. Due to the low amount of SO_2 emitted from the facility, control equipment would be cost prohibitive. Therefore, the Department concurs with NWE's proposal and determined that combusting only pipeline quality natural gas (with ultra low sulfur fuel oil (#2) as backup) coupled with proper operation and design as BACT. The use of ultra low sulfur fuel oil (#2) would be limited in this permit to no more than 720 hours/year per generating unit.

E. BACT for the emergency Water Pump and BACT for the emergency Generator

The emergency water pump and emergency generator were not included in this analysis because of their 'emergency use' status. These sources are only utilized during facility upsets and not during normal operations. Both units would be limit to 500 hours of operation per year. The emissions for all the criteria pollutants are less than five ton per year. Any additional controls would be cost-prohibitive. Therefore, further BACT analysis is not required for the emergency water pump or the emergency generator.

IV. Emission Inventory[1,3]

Source	Emissions (tons/year)						
	PM	PM_{10}	$PM_{2.5}$	NOx	VOC	CO	SO_2
Four FT Swiftpacs (NG)	127.90	127.9	127.90	193.95	43.27	188.87	14.54
Four FT Swiftpacs (LIQ)	55.58	55.58	55.58	29.06	54.66	28.31	2.30
Emergency Generator	0.02	0.13	0.12	4.45	0.18	0.18	0.13
Building Heaters (3 @ 1 MMBtu)	0.10	0.10	0.10	1.29	0.07	0.00	0.01
Building Heaters (1 @ 2 MMBtu)	0.07	0.07	0.49	0.43	0.05	0.36	0.00
Building Heaters (1 @ 3 MMBtu)	0.10	0.10	0.73	1.29	0.07	1.08	0.01
Building Heaters (1 @ 0.5 MMBtu)	0.02	0.02	0.12	0.21	0.01	0.18	0.00
Emergency Fire pump	0.04	0.06	0.25	3.68	0.14	0.85	0.21
Two Diesel tanks (1,000,000 gallons)	----	----	----	----	----	----	0.13
Fugitives[2]	0.58	0.16	0.02	----	----	----	----
Total Annual Emissions	**184.40**	**184.11**	**185.31**	**234.35**	**98.45**	**219.82**	**17.34**

[1] Emissions were over estimated because calculations were based on natural gas operation for 8760 hours per year plus liquid fuel operation for up to 720 hours per year (per NWE). Further, when MCGS operates on fuel oil, the emissions should be much less than calculated because the emission factors used were based on operating both turbines (the generating unit) even though the facility has the potential to only operate one turbine--which would essentially half their emissions. However, the Department did not have emission factors to support this change.
[2] Fugitives include liquid fuel and ammonia delivery in addition to plant road traffic fugitives.
[3] The majority of the emission calculations are shown below, the entire emission's inventory is on file with the Department.

Pratt and Whitney FT8 Swiftpac- 49.6 MW *(Sources #01, #02, #03, and #04)*

Assumptions:

Nominal Twin Pack Size =	49.6 MW	{Source - Application}
Hours of Operation =	8,760 hr/yr	
Natural Gas Higher Heating Value =	21,488 Btu/lb	{Source - Application}
Natural Gas Lower Heating Value =	19,367Btu/lb	{Source - Application}
Assumed max sulfur in Natural Gas=	0.50 grains/100 scf	{Source - Application}
Natural Gas Fuel Heating Value =	1,020 Btu/SCF	{Source - Application}

Simple Cycle Generating Unit - 49.6 MW (4 each using Natural Gas)

PM Emissions:
Emission Factor: 7.30 lb/hr (BACT Emission Limit, 30-day rolling avg)
Annual Calculations: 7.3 lb/hr * 8760 hr/yr * 0.0005 ton/lb * 4 units= 127.90 tpy

PM-10 Emissions:
Emission Factor: 7.30 lb/hr (BACT Emission Limit, 30-day rolling avg)
Annual Calculations: 7.3 lb/hr * 8760 hr/yr * 0.0005 ton/lb * 4 units= 127.90 tpy

PM-2.5 Emissions:
Emission Factor: 7.30 lb/hr (BACT Emission Limit, 30-day rolling avg)
Annual Calculations: 7.3 lb/hr * 8760 hr/yr * 0.0005 ton/lb * 4units = 127.90 tpy

NOx Emissions:
Emission Factor: 11.07 lb/hr (BACT Emission Limit, 30-day rolling avg)
Annual Calculations: 11.07 lb/hr * 8760 hr/yr * 0.0005 ton/lb * 4 units= 193.95 tpy

VOC Emissions:
Emission Factor: 2.47 lb/hr (BACT Emission Limit, 30-day rolling avg)
Annual Calculations: 2.47 lb/hr * 8760 hr/yr * 0.0005 ton/lb * 4 units= 43.27 tpy

CO Emissions:
Emission Factor: 10.78 lb/hr (BACT Emission Limit, 30-day rolling avg)
Annual Calculations: 10.78 lb/hr * 8760 hr/yr * 0.0005 ton/lb * 4 units= 188.87 tpy

SOx Emissions:
Emission Factor: 0.83 lb/hr (BACT Emission Limit, 30-day rolling avg)
Annual Calculations: 0.83 lb/hr * 8760 hr/yr * 0.0005 ton/lb * 4 units= 14.54 tpy

Simple Cycle Generating Unit - 49.6 MW (8 turbines per generating unit using Ultra low sulfur fuel oil (#2))

Assumptions:

Nominal Twin Pack Size =	49.6 MW	{Source - Application}
Hours of Operation =	720 hr/yr	
Higher Heating Value =	19,553 Btu/lb	{Source - Application}
Lower Heating Value =	18,360 Btu/lb	{Source - Application}
Assumed max sulfur =	0.0015	{Source - Application}

PM Emissions:

Emission Factor:	19.3000 lb/hr	(BACT Emission Limit, 30-day rolling avg)
Annual Calculations:	19.3 lb/hr * 720 hr/yr * 0.0005 ton/lb * 8 turbines =	55.58 tpy

PM-10 Emissions:

Emission Factor:	19.3000 lb/hr	(BACT Emission Limit, 30-day rolling avg)
Annual Calculations:	19.3 lb/hr * 720 hr/yr * 0.0005 ton/lb * 8 turbines=	55.58 tpy

PM-2.5 Emissions:

Emission Factor:	19.3000 lb/hr	(BACT Emission Limit, 30-day rolling avg)
Annual Calculations:	19.3 lb/hr * 720 hr/yr * 0.0005 ton/lb * 8 turbines =	55.58 tpy

NOx Emissions:

Emission Factor:	10.0900 lb/hr	(BACT Emission Limit, 30-day rolling avg)
Annual Calculations:	10.09 lb/hr * 720 hr/yr * 0.0005 ton/lb * 8 turbines=	29.06 tpy

VOC Emissions:

Emission Factor:	18.98 lb/hr	(BACT Emission Limit, 30-day rolling avg)
Annual Calculations:	18.98 lb/hr * 720 hr/yr * 0.0005 ton/lb * 8 turbines=	54.66 tpy

CO Emissions:

Emission Factor:	9.83 lb/hr	(BACT Emission Limit, 30-day rolling avg)
Annual Calculations:	9.83 lb/hr * 720 hr/yr * 0.0005 ton/lb * 8 units=	28.31 tpy

SOx Emissions:

Emission Factor:	0.8 lb/hr	(BACT Emission Limit, 30-day rolling avg)
Annual Calculations:	0.8 lb/hr * 720 hr/yr * 0.0005 ton/lb * 8 turbines=	2.30 tpy

V. Existing Air Quality

NWE's facility also known as the Mill Creek Generating Station (MCGS) is located near the intersection of MT-1 and county road 273 approximately 3 miles southeast of Anaconda, Montana. The property lies within a 50-acre parcel in the NW¼ of Section 17 and the SW ¼ of Section 8, Township 4 North, Range 10 West in Deer Lodge County, Montana.

VI. Ambient Air Impact Analysis

The air quality classification of the immediate area is "Unclassifiable/Attainment" for all pollutants (40 CFR 81.327). The city of Butte and surrounding area is classified as nonattainment for PM_{10} upon based on 24-hour monitoring values. This PM_{10} nonattainment area (NAA) boundary is about 13 miles (21 kilometers) to the southeast of the MCGS. The closest federally mandatory Class I area is the Anaconda-Pintler Wilderness Area, which is about 16 miles (26 km) southwest of the facility.

CLASS II Significant Impact Analysis

NWE provided significant impact analyses for the simple cycle generating units using both natural gas and liquid fuels. Results are shown below in Table 1. NWE's significant impact model results are compared to the applicable Class II significant impact levels (SIL's) in Table 1. NWE's impacts exceed the SILs for $PM_{2.5}$, PM_{10} and NOx. The maximum radius of impact (ROI) was 37.7 km for $PM_{2.5}$ (24-hour average). The area within the ROI is referred to as the significant impact area (SIA). As shown in Table I, CO was the only pollutant that did not exceed either modeling significance level and no further analysis was necessary.

Table 1: Class II SIA results for NWE

Pollutant	Averaging Period	Met Year	Fuel Type	Flow Rate	Modeling Significance Level ($\mu g/m^3$)[1]	H1H Modeled Result ($\mu g/m^3$)	Radius of Impact (km)[3]
NOx	Annual	BTM 1998	Both	Low	1.0	1.44	0.2
CO	1-Hour	NA[4]			2000	NA	0.00
	8-Hour				500		
PM_{10}	24-Hour	MSE 1987	Liquid	High	5	39.39	24.1
	Annual	NA			1	NA	0.0
$PM_{2.5}$	24-Hour	BTM 1998	Liquid	High	1.2	6.72	37.7
	Annual	RP 1995	Both		0.3	0.32	2.5

*All concentrations are high-1st-high for comparison to SIL's.

NAAQS/MAAQS COMPLIANCE DEMONSTRATION

Because the significance levels were exceeded for NOx, PM_{10}, and $PM_{2.5}$, NWE was required to conduct National Ambient Air Quality Standards/Montana Ambient Air Quality Standards (NAAQS/MAAQS) modeling to demonstrate compliance. This is completed by incorporating all minor sources located within the largest significant impact area (SIA) or within 37.7 km and all major emission sources within 87.7 km (SIA + 50 km).

Modeling results are compared to the applicable MAAQS and NAAQS in Table 2. Modeled concentrations show the impacts from MCGS and applicable sources (including the Department's general background values). As shown in Table 2, the modeled concentrations are below the applicable NAAQS/MAAQS.

Table 2: NAAQS/MAAQS Compliance Demonstration[6]

Pollutant	Averaging Period	Met Year	Fuel Type	Flow Rate	Modeled Result ($\mu g/m^3$)[1]	MDEQ Default Back-Ground ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS[2] ($\mu g/m^3$)	Compliance?	MAAQS[3] ($\mu g/m^3$)	Compliance?
NO_2	1-Hour	MSE 1987	Liquid	High	271[4]	75	346	NA[5]		564	Yes
	Annual	BTM 1998	Both	Low	1.6	6	7.6	100	Yes	94	
PM_{10}	24-Hour	RP 1996	Liquid	High	29.8	30	59.8	150		150	
	Annual		Both		4.1	8	12	50		50	
$PM_{2.5}$	24-Hour	RP 1994 -1996	Liquid		3.80	30	33.80	35		NA	
	Annual		Both		2.1	8	10.1	15.0			

1. µg/m3 = micrograms per cubic meter.
2. NAAQS = National Ambient Air Quality Standard.
3. MAAQS = Montana Ambient Air Quality Standard.
4. The Ozone Limiting Method was applied on the 1-hour NOX modeled result for comparison to the 1-hour MAAQS.
5. NA = Not Applicable; MDEQ does not have PM2.5 MAAQS at this time.
6. For comparison to each standard, the selection of the concentration was based 40 CFR Part 50-51.

Since Continental Energy Services (CES) triggered the minor source baseline date for NOx and PM_{10}, PSD Class II Increment Analysis was required.

Table 3. NOx and PM_{10} Class II Increment Analyses.

Pollutant	Averaging Period	Met Year	Fuel Type	Flow Rate	Increment ($\mu g/m^3$)[1]	Modeled Result ($\mu g/m^3$)
NOX	Annual	MSE 1987	Both	Low	25	1.6
PM_{10}	24-Hour	MSE 1987	Liquid	High	30	17.4
	Annual	RP 1996	Both		17	0.04

1. µg/m3 = micrograms per cubic meter

CLASS I SIGNIFICANT ANALYSIS

The closest federally mandatory Class I area is the Anaconda-Pintler Wilderness Area, which is about 16 miles (26 km) southwest of the facility. To determine the impacts of the MCGS emissions on this Class I area, modeling was conducted and results are shown in Table 4.

Table 4. Class I Significance Analysis Results.

Pollutant	Averaging Period	Met Year	Fuel Type	Flow Rate	Modeling Significance Level ($\mu g/m^3$)[1]	H1H[2] Modeled Result ($\mu g/m^3$)
NOx	Annual	BMT 1998	Both	High	0.10	0.001
PM_{10}	24-Hour	MSE 1987	Liquid		0.20	0.095
	Annual		Both		0.30	0.004

1. *µg/m3 = micrograms per cubic meter*
2. *For the annual averaging period, the H1H was seclected; the 24-hour averaging period the H2H was used.*

Modeling concluded that the Class I Anaconda-Pintler Wilderness Area will not be significantly impacted by the MCGS NOx and PM_{10} emissions. The annual NOx and PM_{10} MCGS emissions were about 1% of their respective modeling significance levels whereas the 24-hour PM_{10} emissions were about 50%.

CONCLUSION

The modeling results for MCGS NWE’s natural gas-fired power plant project have demonstrated compliance with the NAAQS/MAAQS and PSD increments.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

YES	**NO**	
X		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	X	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	X	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	X	4. Does the action deprive the owner of all economically viable uses of the property?
	X	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	X	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	X	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	X	7a. Is the impact of government action direct, peculiar, and significant?
	X	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	X	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	X	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

Analysis Prepared By: Jenny O'Mara
Date: December 15, 2008

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air and Waste Management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: NorthWestern Energy
40 E. Broadway
Butte, MT 59701

Air Quality Permit Number: #4255-00

Preliminary Determination Issued: 12/19/08
Department Decision Issued: 01/06/09
Permit Final: 1/22/09

1. *Legal Description of Site*: NWE facility also known as the MCGS would locate near the intersection of MT-1 and county road 273 approximately 3 miles southeast of Anaconda, Montana. The property would lie within a 50-acre parcel in the NW¼ of Section 17 and the SW ¼ of Section 8, Township 4 North, Range 10 West in Deer Lodge County, Montana.

2. *Description of Project*: NWE applied to the Department for a MAQP for the construction and operation of a "regulation resource" electrical generation power plant. The plant was designed to use pipeline quality natural gas and/or ultra low sulfur fuel oil (#2) for fuel, and would provide approximately 200 MWe of energy at an average temperature of 40°F. Natural gas would be the primary fuel of choice for normal operations and startup, and would only be replaced with liquid fuels (#2 ultra low sulfur fuel oil) when natural gas cannot be transported from supply source to the project through the NWE natural gas transmission system at the rate required to operate the turbines.

   Approximately 2.5 miles of natural gas pipeline would be constructed to the plant from the existing NWE pipeline that serves Anaconda to supply natural gas to the facility. Sources of natural gas transmitted in the pipeline include gas fields in northern Montana and Canada. NWE has estimated actual fuel consumption of the plant would be approximately 3,500 million standard cubic feet (MMscf) per year of natural gas and approximately 2 million gallons per year of ultra low sulfur fuel oil (#2). In order to maintain the correct pressure of the natural gas, a compressor station (permitted separately) would be located about 2.5 miles from the facility.

   As such, NWE proposes to construct and operate a facility equipped with four Swiftpac™ generation units manufactured by Pratt & Whitney. Each of the four simple-cycle, dual fuel-fired generating units consist of two aeroderivative combustion turbines and one electric generator and are rated at 49.6 megawatts (MW).

   NWE proposes phased construction of the simple-cycle turbines along with other miscellaneous equipment, including: a 1675 horsepower (hp) emergency diesel generator, a 308 hp emergency diesel fired water pump, two above-ground 1,000,000 gallon diesel fuel tanks and two 10,000 gallon aqueous ammonia tanks. Emissions from the facility will be controlled utilizing water injection, selective catalytic reduction (SCR) and catalytic oxidation (CO).

3. *Objectives of Project*: The proposed facility would operate as a "regulation resource". NWE currently operates its balancing authority area without the benefit of owning any rate-based generation. A balancing authority is an electrical footprint of loads and resources that must be in balance at all times in order to meet operating criteria and to provide reliable service to customers.

Specifically, NWE must have tools available to balance, on a moment-to-moment basis, the difference between resource and loads within its balancing authority. Failure to provide for regulating reserves would prevent NWE from complying with the Federal Energy Regulatory Commission (FERC) approved mandatory reliability standards set out by the North American Electric Reliability Council (NERC) and the Western Electricity Coordinating Council (WECC) for instantaneously balancing resources with load responsibility. Failure to comply with the reliability standards could adversely affect wholesale and retail customers, potentially impact other balancing authorities in the Western Interconnect, and result in NERC-imposed sanctions and/or civil penalties.

Therefore, the objective of the project would be for the MCGS facility to serve as a regulating resource to stabilize the transmission grid due to non-dispatchable and unpredictable fluctuations from intermittent renewable resources, such as wind power. The MCGS was designed to stabilize moment-to-moment changes in the difference between load and generation. As a result, the facility must be available to operate 24 hours a day, 365 days per year. The facility's combined output will be approximately 200-MW power for delivery to the existing power grid.

4. *Alternatives Considered*: In addition to the proposed action, the Department also considered the "no action" alternative. The "no action" alternative would deny the issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no action" alternative to be appropriate because NWE demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a Best Available Control Technology (BACT) analysis, would be included in MAQP #4255-00.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions would be reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and would not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no action" alternative was discussed previously.

Potential Physical and Biological Effects							
		Major	Moderate	Minor	None	Unknown	Comments Included
A.	Terrestrial and Aquatic Life and Habitats			X			yes
B.	Water Quality, Quantity, and Distribution			X			yes
C.	Geology and Soil Quality, Stability, and Moisture			X			yes
D.	Vegetation Cover, Quantity, and Quality			X			yes
E.	Aesthetics			X			yes
F.	Air Quality			X			yes
G.	Unique Endangered, Fragile, or Limited Environmental Resource			X			yes
H.	Demands on Environmental Resource of Water, Air, and Energy			X			yes
I.	Historical and Archaeological Sites			X			yes
J.	Cumulative and Secondary Impacts			X			yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

The proposed facility would locate within the South Uplands Unit of the Anaconda Smelter National Priorities List (NPL) at the existing Mill Creek electrical power substation that currently covers approximately 10 acres. In total, the MCGS would have approximately 50 acres (including the existing substation) for the project area but the foot print of the facility would be less.

Impacts to terrestrial and aquatic life and habitats from construction and operation of the electric generation facility would be minor because of the relatively small portion of land that would be disturbed. Terrestrials such as livestock, deer, elk, moose, and rodents would use the general area near the facility. The area surrounding the facility would be fenced to limit access to the site. Fencing would not restrict access from all animals that frequent the area, but would discourage most animals from entering the facility.

There are no wetlands listed for the project site according to the Riparian and Wetland Research Program (RWRP) database, the Natural Heritage Wetland Program (NHWP) database, or the Department's database. However, the final design report for the South Opportunity Uplands area of the Anaconda Superfund Site indicates the presence of wetland north of the existing substation and east of the project site along Mill Creek . These wetlands were part of delineation activities that occurred in 1999 and since then the project site surface conditions have been altered to address arsenic-impacted soils. However, it is anticipated that activities associated with the proposed MCGS will have no adverse impacts on identified but altered wetlands.

Installation and connections of sewer, water, and natural gas pipelines to the site would result in minimal impact on the terrestrial and aquatic life and habitats. Installation of utilities would result in very little impact on the terrestrial and aquatic life and habitats because there would be minimal disturbance and any disturbance would be temporary and of short duration. As stated above, the area is currently occupied by the Mill Creek electrical substation and the addition of the MCGS facility would cause minor impacts to the area. Overall, the impacts from this project to terrestrial and aquatic life and habitats would be minor.

B. Water Quality, Quantity, and Distribution

There are no surface water bodies on the site and the nearest surface water body would be Mill Creek, which would be located several hundred feet southeast of the proposed facility. All applicable Department permits would be in place prior to facility construction in order to minimize impacts to Mill Creek. Wastewater from the facility would be treated on-site prior to discharging to the City of Anaconda sewer system. NWE has estimated that the maximum amount of wastewater discharged from the facility would be approximately 40,000 gpd. The City of Anaconda currently treats less than 1.0 million gpd of wastewater and according to NWE the plant's maximum capacity is 5.2 million gpd. Any additional wastewater from the MCGS facility would represent only a small portion of the average daily throughput for the City of Anaconda.

Process water for the facility is estimated at approximately 250,000 gallons per day and would be obtained from the Silver Lake pipeline. The primary use of this water would be used to control oxides of nitrogen (NOx) with wet injection coupled with an SCR for each generating unit. As proposed, MCGS operations would have no impact on the water supply for the City of Anaconda because NWE proposes to have potable water delivered by a bottled water company to the facility. Therefore, the proposed facility would result in minor impacts to water quality, quantity, and distribution in the area.

C. Geology and Soil Quality, Stability, and Moisture

Impacts to the geology and soil quality, stability, and moisture from this facility would be minor because the project would impact a relatively small portion of land and the amount of resulting deposition of the air emissions would be small. Approximately 40 acres or less would be disturbed for the physical construction of the facility and the remaining 10 acres are part of the existing Mill Creek electrical power substation. The project would be located within the Anaconda Superfund site which already has arsenic-impacted soil. According to NWE any disruption or displacement of soils during the construction project will be managed according to the Environmental Protection Agency/ARCO Soil Management Plan.

According to information provided by the applicant, available geologic mapping indicates that the general geology in the project area consists of "Surficial Sedimentary Deposits: **QS-** Alluvium, and terrace gravel, gravel deposits on pediment surfaces, and landslide and travertine deposits: till, glacial lake, and outwash deposits" and "Sedimentary Deposits and Rocks: **Ts-** Fan and gravel deposits on pediment conglomerate, sandstone, mudstone, and volcanic ash beds".

There are no known unique geologic or physical features at the site. NWE reported that in 2007, two bore holes were drilled to a depth of 20 feet below ground surface by SK Geotechnical at the facility location. Topsoil and the root zone were encountered at two to three inches below ground surface. Below the topsoil and root zone to the total depth, the soil profile was alluvium/glacial deposits consisting of poorly graded gravels with silt, sand, and cobbles. Groundwater was not observed in the bore holes. The subsurface soils are considered more than adequate to support the foundations for the simple cycle combustion units. The soil stability in the immediate vicinity would be impacted by construction activities, but disturbances would be temporary. The facility would not discharge any material to the soil. Installing connections of sewer, water, and natural gas pipelines to the site would result in minimal impact on geology and soil quality, stability and moisture because the construction would be temporary and of short duration.

The majority of construction required for the facility would be the turbine building, with building dimensions of approximately 100-feet wide, 315-feet long, and 30-feet high. Although the project will impact the soil stability it will only be temporary and of short duration. Overall, the Department believes there would be minor impacts to geology, soil quality, stability, and moisture.

D. Vegetation Cover, Quantity, and Quality

The proposed project would result in minor impacts on the vegetative cover, quantity, and quality in the immediate area because only a small amount of property would be disturbed and the resulting deposition from air emissions would be relatively small. Approximately 40 acres of land would be impacted by the construction and operation of the facility with an additional 10 acres already occupied by the Mill Creek electrical power substation. As stated above, the project site would be located within the South Uplands Unit of the Anaconda Smelter Superfund site. According to NWE, in 2007, the project site was graded and soils mixed to address arsenic-impacted soils.

The project site would be located in an industrial area where vegetation is sparse to none. In comparison to the surrounding area, the disturbance of this acreage would be very small. The vegetated areas outside of this proposed project include: small stands of cottonwoods and other deciduous species, grasslands with Great Basin wildrye and redtop, and scattered shrub lands with rabbitbrush (Chrysothamnus nauseosus), currant and Woods rose. See Section 8.D of this EA. In addition, as described in Section 7.F of this EA, the impacts from the air emission from this facility are minor.

There are no known endangered or threatened plant species at the project site. Installing connections of sewer, water, and natural gas pipelines to the site will result in minimal disturbance to the land and the disturbance will be temporary in areas not previously disturbed. Most of the newly disturbed areas would be restored to their previous status after installation of utilities. The corresponding deposition of the air pollutants on the surrounding vegetation would also be minor.

Any disturbances would be of short duration and the area would be returned to its current status. Therefore, the proposed project would result in minor impacts on the vegetative cover, quantity, and quality.

E. Aesthetics

Impacts to the aesthetics of the area from this project would be minor because the land use near the project area is primarily agricultural grazing, recreation and open space mixed with commercial/industrial areas for gravel mining and an electrical substation. There are large overhead power lines extending from the substation to near the proposed project area. According to the application, each of the four generating units have the following footprint: 120 feet wide, 120 feet long and 30 feet high. Emissions from each Swiftpac™ would be emitted to the atmosphere through separate stacks measuring approximately 15 feet in diameter and 90 feet tall.

Other equipment that would be located on-site includes: two 1,000,000 gallon domed roof tanks for on-site storage of liquid fuels, two 10,000 gallon storage tanks used to store aqueous ammonia (19%) for the oxides of nitrogen (NOx) air pollution control device (selective catalytic reduction (SCR) system), raw and demineralized water storage tanks (near the water treatment building). In addition, a maintenance/control/office building would be located at the facility.

The facility would potentially be visible from various roadways in the area, such as: State Highway-1 located approximately 1 mile to the northeast, Mill Creek Road approximately 1/5 mile to the west, and Willow Glen Road approximately 1/5 mile to the southwest of the site. The community of Opportunity would be located approximately 1.5 miles east of the facility and a gravel pit is located approximately 0.25 miles to the northeast.

Water condensable plumes from the facility could be visible on very cold days of very high humidity which would be an unusual occurrence for this area. However, visible emissions from the facility would be limited to 20% opacity.

There would not be an increase in odors with the addition of this facility to the area because odors from the combustion of natural gas would be negligible and would only slightly perceptible, if at all. Odors from the combustion of ultra low sulfur fuel (#2) would be infrequent due to the limited use of this fuel (permit limited to less than 720 hours per year).

The facility would result in some additional noise even though the combustion turbine generating units are designed to meet industry standards for noise levels. Based on the specifications of the generating units, the following noise levels were estimated for the MCGS facility: 91 decibels (dBA) maximum at 3 feet away; 70 dBA maximum at 400 feet away; 65 dBA maximum at 0.25 miles; and 58 dBA at approximately 1.5 miles. The nearest resident would be located at approximately 1.5 miles from the facility. However, for comparison, street noise is estimated at approximately 70 dBA and normal conversation noise (3 feet away) is 60 dBA.

The area would also receive increased vehicle use as a result of the proposed project; however, the Department does not believe that the amount of vehicle trips in the area would increase substantially over the existing traffic patterns. The vehicles would use the existing roads in the area on route to the roads established as part of the facility. During construction of the facility, there might be a noticeable increase; however, it would be temporary. NWE proposes to hire 11 employees and a traffic increase would be minimal.

As previously noted, the proposed facility would be located in the area of the old Anaconda Company copper smelter operations and the nearby Opportunity disposal ponds, both of which are part of the Anaconda Superfund site. Impacts to the aesthetics of the area from the project would be minor because of these other industrial and commercial structures located nearby, and the relatively low visibility and minimal noise from the facility. Odor from the turbines would be negligible when using natural gas and minimal when using fuel oil, visible emissions would be limited to less than 20% opacity. Therefore, the Department believes that aesthetics in the area would only experience minor impacts.

F. Air Quality

The air quality classification of the immediate area is "Unclassifiable/Attainment" for all pollutants (40 CFR 81.327). The city of Butte and surrounding area is classified as nonattainment for PM_{10} upon based on 24-hour monitoring values. This PM_{10} nonattainment area (NAA) boundary is about 13 miles (21 kilometers) to the southeast of the MCGS. The closest federally mandatory Class I area is the Anaconda-Pintler Wilderness Area, which is about 16 miles (26 km) southwest of the facility.

Modeling concluded that the Class I Anaconda-Pintler Wilderness Area would not be significantly impacted by MCGS's NOx and PM_{10} emissions. The annual NOx and PM_{10} MCGS emissions were about 1% of their respective modeling significance levels whereas the 24-hour PM10 emissions were about 50%. In addition, the modeling results for MCGS NWE's natural gas-fired power plant project demonstrated compliance with the NAAQS/MAAQS and PSD increments. Modeling results are included in the permit analysis.

In addition to the modeling analyses, a BACT analysis was performed as part of the permit action. NWE proposed to install wet injection and SCR and a catalytic oxidizer to substantially reduce $NO_{x,}$ CO and VOCs respectively. The results of the BACT analysis were factored into the modeling analysis.

NWE would also emit Hazardous Air Pollutants (HAPs). A major facility for HAPs is defined as a stationary source that has the potential to emit more than 10 tons per year of any individual HAP or 25 tpy of all HAPs combined. This facility is not considered major for HAPs and the highest individual emission rate of an individual HAP would be approximately 6.19 tpy, and the combined emission rate of all HAPs would be about 9.51 tpy. Not only is this source not considered a major source for HAPs, but any impact from HAPs would be minor because the emissions of the HAPs would be dispersed by the wind speed, wind direction, atmospheric stability, stack temperature, and other dispersion parameters in the area.

NWE would emit carbon dioxide (CO_2), which is not a regulated pollutant under either the Federal or Montana Clean Air Acts. Any impact from CO_2 would also be minor-when compared to the CO_2 emissions from other industrial sources in the state and other natural sources of CO_2. Power in Montana is generally created using either one of two fuels—natural gas or coal. Coal-fired power plants generate 1.8 times more CO_2 than a similar sized natural gas fired power plant. The estimated CO_2 emissions from this facility would be 188,000 tons per year, but again, CO_2 is not a regulated pollutant. NWE would be required by the PSC to address CO_2 under House Bill 25 (HB25).

In general the PSC is required to address carbon offsets in their approval process. Section 69-8-421(e) of the Montana Code Annotated (MCA) states: "*When issuing an order for the acquisition of an equity interest or lease in a facility or equipment that was constructed after January 1, 2007, and that is used to generate electricity that is primarily fueled by natural or synthetic gas, the commission shall require the applicant to implement cost-effective carbon offsets. Expenditures required for cost-effective carbon offsets pursuant to this Subsection (6)(E) are fully recoverable in rates." In Section 69-8-103, the MCA, defines "Cost-Effective Carbon Offsets" as a combination of certified actions that are taken to reduce carbon dioxide emissions or that increase the absorption of carbon dioxide, and which collectively do not increase the cost of electricity produced annually on a per-megawatt-hour basis by more than 2.5%, including: actions undertaken by the applicant that reduce carbon dioxide emissions or that increase the absorption of carbon dioxide from a facility or equipment used to generate electricity; or actions by a carbon offset provider on behalf of the applicant. Examples of certified actions to reduce carbon dioxide or to increase the absorption of carbon dioxide include installing emission control/capture equipment, planting trees, engaging in electricity conservation activities, or making payments to "certified" offset providers.* As stated in the MCA, the cost-effective carbon offsets would be included in the charged rates to electricity consumers and become an ongoing expense of operating the facility. In order for the PSC to issue an order for the acquisition of equity interest, NWE is currently developing a cost-effective carbon offset implementation plan to submit to the PSC.

Upgrading the utilities for NWE would result in very little air quality impact because no major air emission activities would be required. The sewer and water system upgrade may require the use of motor vehicles, but the impacts would be minor and of a short time duration. Similarly, minor fugitive dust emissions would result from the sewer and water system upgrade as well, but the emissions would be temporary.

The modeling results for NWE's simple cycle, dual fuel fired generating units have demonstrated compliance with the NAAQS/MAAQS and PSD increments. Overall, the air impacts from NWE are expected to be minor.

G. Unique, Endangered, Fragile, or Limited Environmental Resources

To identify any species of special concern in the immediate area of the proposed project, the Department contacted the Montana Natural Heritage Program of the Natural Resource Information System (NRIS). The Natural Heritage Program identified one endangered species of special concern in the area of the proposed facility. The species identified is the gray wolf.

In the mid-to-late 1980s, in an effort to restore wolf populations, the wolf was reintroduced into three recovery areas – Northwestern Montana, Central Idaho, and the Greater Yellowstone. Wolf populations have increased throughout the last several decades, however, generally, the wolves usually occupy areas with few roads and little human disturbance so it is unlikely that wolves would be impacted by this project. By incorporating the project into an area that is currently occupied by a gravel pit and an electrical substation, there would be little additional impact to the wolf population.

Based on the modeled air quality impacts from NWE, the proposal would have minor, if any impacts on the unique, endangered, fragile, or limited environmental resources in the area. The proposed project would have minor impacts on limited, non-renewable resources because the amount of natural gas consumed by the facility would be relatively small in comparison to the natural gas consumption in Montana and the nation. See Section 7.H of this EA for additional information. The Department believes there would be minor impacts to any unique, endangered, fragile, or limited environmental resources in the area.

H. Demands on Environmental Resource of Water, Air, and Energy

As described in Section 7.B of this EA, impacts to the water resource would be minor. The facility will not directly discharge any material to the surface or ground water in the area other than a minor amount of stormwater runoff.

All applicable Department permits would be in place prior to facility construction in order to minimize impacts to Mill Creek. Wastewater from the facility would be treated on-site prior to discharging to the City of Anaconda sewer system. NWE has estimated that the maximum amount of wastewater discharged from the facility would be approximately 40,000 gpd. The City of Anaconda currently treats less than 1.0 million gpd of wastewater and according to NWE the plant's maximum capacity is 5.2 million gpd. Any additional wastewater from the MCGS facility would represent only a small portion of the average daily throughput for the City of Anaconda.

Process water for the facility is estimated at approximately 250,000 gallons per day and would be obtained from the Silver Lake pipeline. The primary use of this water would be used to control oxides of nitrogen (NOx) with wet injection coupled with an SCR for each generating unit. As proposed, MCGS operations would have no impact on the water supply for the City of Anaconda because NWE proposes to have potable water delivered by a bottled water company to the facility.

As described in Section 7.F of this EA, the impact on the air resource in the area of the facility would be minor. Ambient air modeling for NO_X, CO, VOC, PM, PM_{10}, and SO_2 was conducted for the facility at "worst case" conditions that demonstrates that the emissions from the proposed facility would not exceed any ambient air quality standard.

The impacts to the energy resource from this facility would be minor. The facility would consume approximately 3500 MMscf/year of natural gas. In comparison to the natural gas consumed nationally and many other facilities in the area, this is minor. Because this project serves as a regulating resource to stabilize the transmission grid due to non-dispatchable and unpredictable fluctuations from intermittent renewable resources, such as wind power the Department believes the impacts to energy would be minor.

Impacts to the water quality and quantity would be minimal due to the fact that no potable water other than bottled water would be available on-site; Anaconda has more than enough capacity in their wastewater system to handle NWEs wastewater; process water would be available from Silver Lake; due to dispersion air quality would be minimal; and energy use would be minimized with the use of Pratt & Whitney's Swiftpac generating units. Therefore, the Department believes the project would result in minor impacts to demands on environmental resources of water, air, and energy.

I. Historical and Archaeological Sites

The Department contacted the Montana Historical Society – State Historic Preservation Office (SHPO) in an effort to identify any historical, archaeological, or paleontological sites or findings near the proposed project. SHPO's records indicate that there are currently no previously recorded cultural properties within the project site. Because of the fact that the site has been previously disturbed, the likelihood of finding undiscovered or unrecorded historical properties is practically nil.

Impacts on historical and archaeological sites would be minor because the site location contained no visible standing structures, the facility would physically impact a small amount of property (approximately 50 acres), the facility would locate within an area that has been previously disturbed and designated as Superfund. The old Anaconda Copper Company smelter stack, located approximately two miles west of the site, is listed in the National Register of Historic Places.

Therefore the Department believes that there is a minor likelihood that cultural properties would be impacted. However, should cultural materials be inadvertently discovered during this project SHPO requested that they be contacted to investigate the site.

J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the physical and biological aspects of the human environment would be minor because the impact from MCGS would be relatively minor. The proposed facility would locate in close proximity to power lines and a natural gas distribution pipeline. Because the connections to electrical lines and building of gas and water pipelines create minimal disturbance to the environment and the disturbances would be temporary, the overall impact would be minor.

Based on modeling, using the “worst case” potential air emissions and other emission sources (i.e., MSE, MR, ASiMI, and CES, etc), the NAAQS/MAAQS for PM, PM_{10}, $PM_{2.5}$ NOx, and CO would not be violated for this project. In addition, the Class I and Class II area modeling analysis indicated that the PSD increments would not be exceeded for NOx or PM_{10}. The NOx and PM_{10} Class I PSD Increment modeling analysis was conducted for the nearest Class I area, the Anaconda Pintler Wilderness Area. Finally, because the proposed facility would not be located in the PM_{10} nonattainment area and NWE has shown compliance with the NAAQS, the facility would have minor impacts to the surroundings. The PM_{10} modeling results showed that emissions from the addition of the MCGS facility (along with the other local sources) would comply with annual and 24-hour PM_{10} NAAQS/MAAQS. Therefore, the Department believes that impacts to Air Quality would be minor.

8. *The following table summarizes the potential social and economic effects of the proposed project on the human environment. The "no action" alternative was discussed previously.*

Potential Social and Economic Effects							
		Major	Moderate	Minor	None	Unknown	Comments Included
A.	Social Structures and Mores				X		yes
B.	Cultural Uniqueness and Diversity				X		yes
C.	Local and State Tax Base and Tax Revenue			X			yes
D.	Agricultural or Industrial Production			X			yes
E.	Human Health			X			yes
F.	Access to and Quality of Recreational and Wilderness Activities			X			yes
G.	Quantity and Distribution of Employment			X			yes
H.	Distribution of Population				X		yes
I.	Demands for Government Services			X			yes
J.	Industrial and Commercial Activity			X			yes
K.	Locally Adopted Environmental Plans and Goals				X		yes
L.	Cumulative and Secondary Impacts			X			yes

SUMMARY OF COMMENTS ON POTENTIAL SOCIAL AND ECONOMIC EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores
B. Cultural Uniqueness and Diversity

The proposed facility would not cause a disruption to any native or traditional lifestyles or communities (social structures or mores, or cultural uniqueness and diversity) in the area because the land use proposal would not be out of place given the industrial land use of the surrounding area. The area is currently occupied by an existing electrical substation and MCGS would co-locate with the substation on the facility property. In addition to these industrial land uses, there is an existing gravel pit located north of this facility. The connections of natural gas, water and sewer pipelines, will not impact social structures or mores because these activities are consistent with activities performed throughout Montana and will be temporary.

C. Local and State Tax Base and Tax Revenue

The facility would have a minor effect on the local and state tax base and tax revenue because the project would result in generating approximately $1.6 million per year in state and local taxes. At the current tax levies in Anaconda-Deer Lodge County, the plant will pay approximately $8.0 million per year. It is estimated that NWE will employ approximately 75 people during the construction phase and, as many as, 11 people during the operation of the facility. Therefore, the Department believes this project would have minor, but positive effects to the local and state tax base and tax revenue

D. Agricultural or Industrial Production

The impacts to agricultural and industrial production in the area from this facility would be minor because the facility would impact such a small amount of land, the impact from the air emissions on the land would be small, and the amount of electricity produced to assist other industrial activities within the state is relatively small. The facility would be located on 50 privately owned by NWE, 10 acres are currently occupied by the Mill Cree electrical substation. The facility would not remove any existing land from agricultural production and would add to other industrial uses in the area.

As described in Section 7.F of the EA, the air quality impacts from this facility are minor, and the resulting deposition of the pollutants from the NWE project is consequently also minor. In addition, as described in Section 7.F, the fact that the facility would comply with the NAAQS (protect public health and promote public welfare) indicates that the impacts from the facility would be minor. Therefore, the Department has determined that the impacts to Agricultural or Industrial Production would be minor.

E. Human Health

As described in Section 7.F of the EA, the impacts from this facility on human health would be minor because the impact from the air emissions would be greatly dispersed before reaching an elevation where humans were exposed. Also, as described in Section 7.F, the modeled impacts from this facility, taking into account other dispersion characteristics (wind speed, wind direction, atmospheric stability, stack height, stack temperature, etc.), are well below the MAAQS, NAAQS, and PSD Increments. The air quality permit for this facility incorporates conditions to ensure that the facility would be operated in compliance with all applicable rules and standards. These rules and standards are designed to be protective of human health.

In addition, the facility has proposed to use SCR coupled with wet injection and catalytic oxidation to reduce emissions. NWE plans to use clean fuels (majority of the fuels used would be pipeline quality natural gas).

Besides the criteria pollutants, the impacts from HAPs would also be minimized by the dispersion characteristics of the facility and the area (wind speed, wind direction, atmospheric stability, stack temperature, facility emissions, etc.). Impacts from other common activities (such as fueling your vehicle for example) would have a greater impact on human health for HAPs because of the concentrations at the point of exposure.

Given these reasons and the fact that the nearest neighbor is approximately 1.5 miles away, the Department believes that the impact to human health would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

Because of the location and the relatively small size of the facility, the proposed facility would result in small or no impacts on the access to and quality of recreational wilderness activities. The air emissions from the facility would disperse before impacting any recreational areas.

Recreational opportunities in the vicinity of the project area include the Copper King Express Excursion train which runs next to the site, the Anaconda Railroad and Mining Museum (approximately 3.5 miles), the Anaconda Smoke Stack State Park (approximately 2 miles), and Old Works Golf Course (approximately 3 miles). Besides the Anaconda Smoke Stack State Park, other state parks in the area include Granite Ghost Town State Park located approximately 25 miles northwest of the facility and Lost Creek State Park located approximately 10 miles northwest of the facility. The recreational activities in the area are approximately 1½ to 2 miles away, and most of the nearby recreational activities are upwind of the predominant wind pattern.

The closest Federal Class I Area would be the Anaconda-Pintler Wilderness located approximately 15 miles southwest of the facility. The closest non-Class I wildlife management area would be the Mount Haggin Wilderness Management Area located approximately 10 miles southwest of the facility. The Warm Springs Wildlife Management Area would also be located approximately six miles north of the facility. Fishing accesses near the facility would be located on the Big Hole River and Georgetown Lake approximately 20 miles from the facility.

No significant recreational or wilderness activities exist within the NWE property boundaries and all recreational activities would remain available. Based on the modeling analysis (see Section 7.F of the EA) and the distance between and direction from the recreational sites and the NWE facility, there would not be any noticeable impacts. This project would not cause denial of access and would not impact wilderness activities, therefore, the Department determined that this facility would have minor impact to recreational and wilderness activities.

G. Quantity and Distribution of Employment

There would be a minor effect on the employment of the area from this project because it would result in approximately 75 construction-related employment opportunities and 11 full-time positions. As such, any effects would be minor but positive in the area.

When feasible and economical, NWE plans on using local contractors and workers for construction and operation. The feasibility would be dependent on availability and qualifications. Therefore, the Department determined that NWE would not negatively impact the quantity and distribution of employment in the area and would have minor impacts, if any.

H. Distribution of Population

The entire project would not affect the normal population distribution in the area because excluding 11 jobs that would result from the facility's operation, the remainder of the jobs created from this project would be temporary. Neither the 11 positions created as a result of facility, nor the numerous temporary construction-related positions would likely affect the distribution of population in the area. Therefore, the Department believes that the distribution of population would not be affected.

I. Demands of Government Services

Demands on government services from this facility would be minor because the facility would pay relatively high taxes and require fewer than average government services once all the necessary permits are received. There may be a minor increase in traffic on existing roads in the area while the facility is under construction, but for the normal operation of the facility traffic increases would be minimal. NWE has been working with all affected local and state agencies in advance to alleviate any additional demands on Government Services. As previously discussed in this EA, process water for MCGS will be obtained from the Silver Lake pipeline and wastewater will be discharged to the Anaconda wastewater system.

Generally speaking, the acquisition of the appropriate permits by the facility, the permits for the associated activities of the project, and compliance verification with those permits would also require minor services from the government. Therefore, the Department believes the demands on Government Services would be minor.

J. Industrial and Commercial Activity

The area both currently and historically has been primarily an industrial area. MCGS would have minor additional impacts to the surrounding area. Although, the NWE facility would cause a minor increase in industrial activity in the area because the facility would operate 24 hours a day and 7 days per week. Given the fact that the area is predominantly industrial, the Department believes that effects to industrial and commercial activity would be minor.

K. Locally Adopted Environmental Plans and Goals

The air quality classification for the immediate area is "Unclassifiable or Better Than National Standards" (40 CFR 81.327) for all pollutants. The city of Butte and surrounding area are classified as non-attainment for PM_{10} with the closest boundary approximately 13 miles to the east of the facility. The closest PSD Class I area would be the Anaconda-Pintler Wilderness located approximately 15 miles southwest of the facility.

The project would be located within the Anaconda Regional Water, Waste, and Soils Operable Unit, RDU 6 - South Uplands Unit of the Anaconda Smelter National Priorities List (NPL) Site (Anaconda Superfund site). RDU 6 covers approximately 300 square miles in the southern Deer Lodge Valley and surrounding foothills.

The proposed facility would locate outside of the nonattainment area and would result in only minor impacts because the PM emissions from the facility have been modeled to demonstrate that the facility would not have a significant impact on the adjacent PM_{10} nonattainment area. The modeling inputs were based on the "worst case" PM emissions from the facility.

The Department is unaware of any other locally adopted environmental plans and goals that would be affected by the facility, or the other portions of the project, as identified at the beginning of this EA. In addition, NWE has been proactive with local and state agencies to minimize impacts. Therefore the Department believes there would be minor impacts to locally adopted environmental plans and goals.

L. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the social and economic aspects of the human environment would be minor because some new full-time employment opportunities may result, temporary construction related employment opportunities would be available, state and local taxes would be generated, and the facility could sell power to other residents and industries in Montana. Overall, the NWE project would result in additional jobs for the area. As described in Section 8.G of this EA, the facility would employ approximately 11 full-time people and approximately 75 people during the peak construction phase. The possible "day-to-day" normal operation positions and the construction-related positions created by MCGS would bring additional revenue into the economy.

Recommendation: An Environmental Impact Statement (EIS) is not required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: All potential effects resulting from construction and operation of the proposed facility are minor, therefore, an EIS is not required. In addition, the source would be applying the Best Available Control Technology and the analysis indicates compliance with all applicable air quality rules and regulations.

Other groups or agencies contacted or which may have overlapping jurisdiction: Department of Environmental Quality – Permitting and Compliance Division (Air Resources Management Bureau); Public Service Commission (PSC), Montana Natural Heritage Program; and State Historic Preservation Office (Montana Historical Society). In addition, NWE hosted a public meeting at the Anaconda High School on October 14, 2008 where few negative comments resulted—most were proponents of the project.

Individuals or groups contributing to this EA: Department of Environmental Quality (Air Resources Management Bureau and Water Quality Bureau) Montana Natural Heritage Program, State Historic Preservation Office (Montana Historical Society), Shaw, Stone and Webster and Bison Engineering.

EA Prepared By: Jenny O'Mara
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